His Most Excellent Majesty

GEORGE THE FOURTH,

This Celestial Atlas,

IS

(with Permission)

Most Respectfully Dedicated

BY

His Majesty's

Most dutiful and Faithful

Subject and Servant,

ALEXANDER JAMIESON.

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PREFACE.

In oldest time, when from primæval night,
Creation rose, to being, bliss, and light,
Above th' ethereal vault, yon concave blue!
The Architect divine, to angels' view,
Bid, with surrounding globes, the pendent earth
*First charm the gaze, and smiling leap to birth.**

SEVERAL years have elapsed since I first undertook the construction of this Atlas, and were I now to obey the feelings excited by its completion, the Preface I should have to offer would be a history of its progress from beginning to end. But as a narrative of this kind might be deemed impertinent, since it would necessarily be a sketch of my own life for that period, I have chosen rather to conceal from the world's eye the picture I could draw of difficulties arising out of the task I had assigned myself, and of discouragements which the interests and prejudices of some little minds unceremoniously forced upon me. Satisfied, however, that my labours would finally be crowned with success, and that my endeavours to benefit science would be appreciated by those who make Astronomy an amusement or a study, I encountered every difficulty with a firm persuasion that it might be overcome; and the rebuffs which came from quarters where I least expected them, served only to encrease my perseverance, by leaving me to my own resources for the production of a work which now stands single and alone in the English language. Very different, however, are the feelings with which I shall ever remember the condescension which graced my performance with a beam of royal favour, when a portion of my work was laid before his Majesty for the distinguishing honour of its Dedication.

To that Public who are now my judges, I must leave the fate of my labours. Many there are who can pronounce on this Atlas as a whole, and their decision will of course stamp its character both as to scientific accuracy and general utility;—in that decision I am most interested. If there be any merit in reviving what the immortal Flamstead first projected, I trust I have earned it; if there be any faults to becloud my performance, they are the offspring of imperfect humanity, but derogate nothing from the perfection of the science in which they may accidentally be detected.

It will be perceived by the Astronomer that the plan of my work differs essentially from M. Bode's *Vorstellung der Gestirne,* which has been the only Atlas that for some time obtained the estimation of Astronomers on the Continent of Europe, or in our own island.

But, Astronomers know that M. Bode did no more than revive the Atlas of M. de la Caille, rectifying the Stars for the period when his *Die Gestirne* was published; and the great Atlas of Flamstead was the basis of M. de la Caille's *Atlas Cœlestis;* for this gentleman merely reduced the English Astronomer's Maps, and rectified the Stars for the period when he undertook the reduction. Let, then, this "plain unvarnished tale" shield me from the charge of plagiarism; for, otherwise, my Atlas differs as much from those I have mentioned, as it is possible for books to differ that have been written in illustration of the same subject. I need say no more to persons who are acquainted with the works to which I have referred; and such as are ignorant of them would not understand, by description, in what respects the Volume before them is an improvement on those that have preceded it.

To M. Bode, however, I beg leave, thus publicly and candidly, to express my unfeigned thanks for the assistance which I have derived from his works; as also to other writers, my contemporaries, from whom I have received obligations, though I have omitted any reference to their names and publications. This acknowledgment will suffice with men of science, and I have rarely trespassed on the humble labours of mere copyists.

Above two years ago, I had completed a series of thirty Projections of the Constellations in the Heavens, which I designed to illustrate as I have now done the Drawings that have been engraved. Those Maps were approved of by very competent judges; but, being upon a large scale, their publication was deemed a speculation of too much risk, and I accordingly adopted the Projections which now appear, as being more suitable in size for a work that might be within the reach of all who value the science to which it belongs.

* TIME, OR LIGHT AND SHADE, Part III. By I. Gompertz, Esq.

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CELESTIAL ATLAS.

DEFINITIONS, &c.

The Stars present to our view the grandest display of the Creator's power and glory. We know that our Earth makes but one of many Planets which revolve round the Sun, and that the Sun shines by his own light. Moreover the Stars partake of the Sun's nature; they shine by their own light, and their distances from our Earth are estimated by the velocity of light. Light moves at the rate of 12 millions of miles in a minute, and yet, it is said, would be three years in passing from the nearest fixed Star to our Earth. The largest and brightest Stars are called Stars of the 1st magnitude; those next in size and lustre, Stars of the 2d magnitude; and so on to the eighth magnitude. But stars of the 7th and 8th magnitudes are not visible to the naked eye. Now, if we suppose their magnitudes to depend on their relative distances from our Earth, we may also conceive them to be separated at as great a distance from each other as they are respectively from the Earth, the circumferences of circles being in proportion to their diameters.

When, on a fine evening, we survey the starry firmament, the heavenly host appears to move from east to west. Some Stars are seen rising in the east, others come directly over our head, and others set in the west. But several never reach the Horizon, and describe circles round a fixed point. To an inhabitant of London, for example, this point is elevated fifty-one degrees thirty-one minutes in the northern part of the Heavens. It is called the *North Pole* of the World; and in the opposite hemisphere, we find a correspondent point, named the *South Pole*.

Of the lines supposed to pass through the Heavens, the following, which occur on our Maps, require brief definition.

The Equinoctial, an imaginary line in the Heavens corresponding with the imaginary Equator on our Earth, is the graduated circle in Maps 1st and 28th, upon which the Astronomical day of *hours*, and also the degrees of *right ascension*, are numbered.

The Ecliptic is that path in the Heavens, which the Earth describes annually. Maps 1st and 28th contain each a half of the ecliptic.

The *Zodiac* is a belt of the Heavens, extending eight degrees on each side of the Ecliptic. The orbits of the Planets, and likewise that of the Moon, are embraced by this circle. The Signs of the Zodiac are Aries ♈, Taurus ♉, Gemini ♊, Cancer ♋, Leo ♌, Virgo ♍, Libra ♎, Scorpio ♏, Sagittarius ♐, Capricornus ♑; Aquarius ♒, and Pisces ♓.

The *Equinoctial points* are the first degrees of Aries and Libra, where the Ecliptic crosses the Equator, the former on the 21st of March, and the latter on the 23rd of September; called respectively the *vernal* and the *autumnal* Equinox.

The *Solstitial points* are the first degrees of Cancer and Capricorn, where the Sun passes the Tropics, on the 22nd of June and the 22nd of December. The former is called the *summer*, and the latter the *winter* Solstice.

The method of ascertaining the situation of the Stars. As the fixed Stars keep nearly the same situation relative to each other, Astronomers have agreed to refer to them, as to so many fixed points, the different motions of the other heavenly bodies. Hence the reason of dividing them into Constellations. But to mark exactly the relative situation of every Star in the celestial sphere,

A great circle is supposed to pass through the two Poles, and through the centre of every Star. This circle is called the circle of *declination*. The arc of this circle, included between the Star and the Equator, measures the *declination* of the Star. The declination of a Star, then, is its perpendicular distance from the Equator. It is north or south as the Star is north or south of the Equinoctial line. And all the Stars situated in the same parallel to the Equator, have the same Declination.

The *Declination* then marks the situation of a Star north or south of the Equator. Precision requires still another circle from which the distance of the Star *east* or *west* may be marked, in order to give the real place. The circle of Declination which passes through that point of the Equator called the *vernal equinoctial point*, has been chosen for that purpose. The distance of the circle of Declination of a given Star from that point, measured on the Equator, or the arc of the Equator, included between the vernal Equinox and the circle of Declination of the Star, is called its *Right Ascension*.

And the *Right Ascension* of the Sun, or of a Star, is reckoned from the first point of Aries upon the Equinoctial eastward round the Heavens. If, therefore, we know the Right Ascension and Declination of a Star, we know its place in the Heavens.

Catalogues of the Stars, as given in this Atlas, enable us to find their places in the Heavens, by inspection, in the same manner as we find the Latitudes and Longitudes of places on the Earth, with this great advantage, that, in the Heavens, Nature lays before us a complete Hemisphere, *every* object in which is visible to our sight in any part of the Earth!

When the Stars are referred to the Ecliptic, the terms Longitude and Latitude are used; and the *Longitude* of the heavenly bodies is measured according to the order of the Signs; for we reckon the Longitude of a Star or Planet by degrees of the Ecliptic, from the first point of Aries round the Heavens. *Circles of celestial longitude* pass through the Poles of the Ecliptic, which they intersect at right angles. They are all dotted lines in our Maps.

The *Latitude* of the heavenly bodies is their distance from the Ecliptic north or south, reckoned on a great circle drawn towards the Pole of the Ecliptic, and never exceeds 90°. The Sun being always in the Ecliptic has no Latitude; a Planet may have 8°.

Parallels of Declination are small circles parallel to the Equinoctial These are all horizontal lines on our Maps.

Parallels of Celestial Latitude are small circles drawn parallel to the Ecliptic. These are all dotted *curved* lines on our Maps.

Celestial Meridians are lines drawn from Pole to Pole, across the Equinoctial; they are also called *circles of declination*, because to them we refer the distance of a Star from the Equinoctial. On our Maps they represent the hour lines at 15° asunder.

The *rising* of any celestial object is when its centre appears in the eastern Horizon; and its *setting* is when its centre disappears in the western Horizon.

The *culminating* of any celestial object is when it comes to the Meridian.

The *Azimuth* of any celestial object is an arc of

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the Horizon, contained between the north and south points, and a verticle circle passing through the object, and it is either easterly or westerly.

Amplitude is the distance of any celestial object from the east or west points of the Horizon, at the time of its rising or setting,—and is either north or south.

The *Altitude* of any celestial object is the arc of a verticle circle, intercepted between the centre of the object and the Horizon.

The *Zenith distance* is what the altitude wants of 90°.

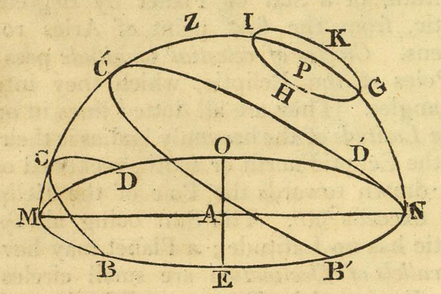
The *Meridian* altitude, is the altitude or zenith distance when the object is in the Meridian.

Orbit is the path which a Planet describes in its revolution round the Sun.

A body is in *conjunction* with the Sun when it has the same longitude, and in *opposition* when the difference of longitude is 180°.

To comprehend with precision the definitions now laid down, we shall have recourse to a diagram.

The circle MONE represents the Horizon, in the centre of which, and on the Earth, an observer A is placed; BCD, B′C′D′ are portions of circles which the heavenly bodies seem to describe round the celestial pole (P), when we fancy they



rise in the East and set in the West. Those whose distance from the Pole is less than the arc PN, which marks the elevation of this point above the Horizon, appear to describe entire circles, such as GKIH. N is the North point of the Horizon: M the South; and consequently MN is the Meridian line, the method of drawing which is explained in Problem V.

The semi-circle MZN, the plane of which is supposed to be perpendicular to the Horizon MENO, and which passes through the points MN, is the celestial Meridian, which divides the arcs BCD, B′C′D′, into two equal parts in the points C, C′.

The point E is the East point of the Horizon, and the point O the West point:—the heavenly bodies seem to move from E to O by traversing the Meridian MZN, which marks the middle of their course.

If we conceive the Terrestrial Globe we inhabit to be insulated, our station in the Horizon and the axis of the Earth being similar as in the diagram, it is evident that the Horizon turning with us during the rotation of the Globe, advances successively towards the Stars situated in the direction of its motion, which consequently seem to be moving in an opposite direction to approach us.

The plane MZN of the Meridian MN, perpendicular to the horizontal plane ENOM, turns also with this latter, and directs itself successively towards the same Stars which are then in the middle of the course which they seem to describe above the Horizon. When the Western edge of the Horizon touches a Star, it appears to set, and ceases to be visible till the motion of the Earth brings the Eastern edge of the Horizon towards it; because, during this interval, the visual rays which touch the Earth pass above the Star.

This illustration accounts, in the most plain and simple manner, for the daily appearance and disappearance of the celestial bodies, by which circumstance the Sun produces the alteration of Day and Night. All the motions alluded to in the preceding definitions, are measured by their angles only, without any consideration of their absolute distances.

The *Zenith* is indicated by Z, being perpendicularly over the observer's head; and the *Nadir* is directly opposite.

If we suppose the plane B′C′D′ to be perpendicular to the axis of rotation, which passes from P through A, till it meets in the opposite hemisphere a point coinciding with P, this plane B′C′D′ will indicate the Equator, all the points of which are at an equal distance from the poles P, P′. It follows from this equality, that, to a spectator placed on the Equator, the Poles are in the Horizon; but as he advances towards either Pole *it* becomes elevated, while the other is depressed.

And the angle PAN which measures the elevation of the Pole above the Horizon, is equal to that which measures the angular distance of a place from the Equator, estimated in the direction of the Meridian. Also the height at which the Equator appears above the Horizon, is the complement of the angle ZAC*; for ZAN, C′AP, being respectively right angles, if we subtract the common angle ZAP, the remainder ZAC′=PAN. Hence if we suppose Z to be London 51° 31′ from the Equator C′, the elevation of the Pole is also 51° 31′. As soon then as the height of the Pole above the Horizon can be determined for any place, the angular distance of this place from the Equator is known, or the number of parts of the Meridian intercepted between this place and the Horizon.

The circumpolar Stars which never set in those places wnere one of the Poles is elevated above the Horizon, determine this immediately; for since they appear to describe circles round the celestial Pole, they are equally distant from it in every direction, and as they pass twice over the Meridian during the diurnal revolution of the Earth, namely, once above the Pole, and once below it, if we measure their angular elevation at each of these positions, and take the mean of these two results, we shall obtain the elevation of the Pole.

Let A be an observer on the Earth, and let GHIK be the circle which a Star describes round the point P; then by measuring the angle IAN when the Star is on the Meridian above the Pole, and also the angle GAN when the same Star is on the Meridian below the Pole; the angles IAP, GAP being equal, the angle PAN is the mean between IAN and GAN, and is equal, consequently, to half their sum. Moreover, if we take half the difference IAG of the angles IAN and GAN, measured between the Star and Horizon, we shall obtain the angle IAP, which will give the angular distance between the observed Star and the Celestial Pole.

Thus, by measuring, for example, at London, during a long winter's night, the two Meridian heights of the Polar Star (α *Ursæ Minoris*, having 88° 20′ 49″ declin. N.) we find that (*Ann.* 1820),

When it passes above the Pole its altitude measures	53° 10′ 11″
And when it passes below the Pole, it measures	49° 51′ 49″
The sum of which is	103° 02′ 00″
And their half	51° 31′ 00″

Which will be the altitude of the Pole above the Horizon of London, or the distance of this city from the Equator.

If, on the contrary, we subtract 49° 51′ 49″ from 53° 10′ 11″, we shall find for their difference 3° 18′ 22′, of which the half 1° 39′ 11″ will give the distance of the Polar Star from the Pole (in 1820), which we thus find does not exactly occupy this point, but is yet very near to it.

The Stars enable us to determine another position relative to any place where our former observation may have been made. Whoever looks at either Maps 1st or 28th, will find that the planes of the different Meridians all intersect each other in the Poles. On all the other Maps the Meridians, or Hour Lines, turning upon the axis of the World, correspond successively to the same Star, and between the passage of the same Star over any two Meridians a period of time elapses which is to the whole time of rotation as the angle made by these Meridians, is to two right angles; so that if the first interval can be measured to compare it with the second, we may deduce the angle which the two Meridians make with each other. This could be done, if we could indicate by a signal visible at the same time to the places under the two Meridians the moment when a Star appears on one of the Meridians; because this instant being marked, a well regulated watch would give the time which elapses between this transit and that of the same Star over the other Meridian.

If, for example, two observers, one at Portsmouth R. N. Academy, and the other at Plymouth garrison, having agreed to determine on the same day, the transit of the same Star over the Meridian of the place they inhabit, and that a signal given the moment when the Star passes the Meridian of Portsmouth Academy, could be visible at Plymouth garrison, about 12 minutes 6 seconds would elapse before the Star would pass the Meridian of Plymouth; and this interval being nearly the 120th part of the diurnal revolution of the Earth, it follows that the plane of the Meridian which passes over the Royal Naval Academy at Portsmouth, makes with that of the plane of the Meridian which passes over the garrison of Plymouth, an angle which is nearly the 120th part of four right angles, or the measure of 3° 1′ 23″ according to actual observation. If for Portsmouth and Plymouth we substitute St. Paul's, London, and Shirburn Castle, the premises will give us one 360th part of the Earth's diurnal revolution, or 4′ in time = 1° of the Equinoctial.

This second position of a place being thus determined, fixes its exact situation; for Shirburn, for instance, being, we shall say, in the same latitude with London, and 4′ later than it. its longitude is 1° West. So also Plymouth is 3° 1′ 23″ West of Portsmouth.

The *Precession of the Equinoxes,* denoting that slow insensible motion by which the Equinoxes change their places, going backward or westward,

* In referring to this diagram so, the reader will understand that a right line is supposed to connect ZA, PA, C′A, &c.

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contrary to the rest of the Signs, may be thus explained. The fixed Stars vary their Right Ascension and Delination, but keep the same Latitude; these variations are accounted for by supposing that the celestial sphere revolves round the poles of the ecliptic. Or, *that the poles of the Equator revolve round those of the Ecliptic.* And this revolution is called *the Precession of the Equinoxes,* because, by it, the time and place of the *Sun's equinoctial station* precedes the usual calculations. The Ecliptic, the Solstices, the Equinoxes, and all the points of the Ecliptic are moving from Aries towards Pisces; *i. e.* from east to west. The Equinoctial points are thence carried further back among the preceding Signs or Stars, at the rate of about one degree in 71 years, and some few days.

The annual Precession is about 50″ ¼; that is, if the Celestial Equator cuts the Ecliptic in a particular point on any day of this year, it will, on the same day of the following year, cut it in a point 50″ ¼ to the *west* of its former intersection, and the Sun will come to the Equinox 20′ 23″ before he has completed his revolution of the Heavens. Thus, the Equinoctial, or Tropical year, or true year of the Seasons, is so much shorter than the revolution of the Sun, or the Sidereal Year. The Equinoctial Points make a complete revolution in about 25,579 years, the Equator being all the while inclined to the Ecliptic in nearly the same angle. Therefore, the Poles of this diurnal revolution must describe a circle round the Poles of the Ecliptic at the distance of nearly 23½ degrees in 25,579 years. Hence the longitude, right ascension and declination of every Star will be variable, and consequently the Pole of the Equinoctial cannot always be directed to the same Star. In the time of Hipparchus the Equinoctial Points were fixed to the first Stars of Aries and Libra; and the Stars which were then in conjunction with the Sun when he was in the Equinox, are now a whole Sign to the eastward of 0° ♈. There are obviously then two Zodiacs, a Zodiac of the Signs, *moveable* round the *fixed* Zodiac and Ecliptic. The precession of the Equinoxes producing an annual increase of 50″ ¼ in the longitude of the fixed Stars, makes exactly a degree in 71 years 19 days and 12 hours. Their right ascension varies from —60″ to+143″ in certain Stars round the Pole. The annual increase in right ascension of others has been given as low as 5″, or about 15′ in 180 years.

Their declinations vary from 20″ to 0″ annually, *plus* or *minus*; or in 72 years from 24 minutes to 2′ 24″ *plus* or *minus*.

These variations, though physically and mathematically correct, are so trifling in a popular display of the Heavens, as to occasion little alteration in the Catalogues and Maps of this Atlas for many years to come. In a word, a careful examination of the Catalogue of Stars annexed to each Constellation, will shew these variations, better than any laboured explanation in words.

Astronomers have reckoned by the fixed and intellectual Zodiac from a very early period; the Egyptians and Chaldeans reckoned according to the intellectual Zodiac, ages before Hipparchus made his discovery of the precession of the Equinoxes. The first of their signs was *Taurus*. Hipparchus was the first among the Greeks, however, who established what is called a fixed Zodiac; and he placed *Aries* as the first of the Signs. This shews that the Greeks were in the habit of copying from the Egyptians in these matters; for the *Ram* has nothing to do with Grecian Mythology; on the contrary, it was the type of the Egyptian Ammon. In the Egyptian Zodiac, by the second *Hermes*, *Aries* is represented as a Man with Ram's horns. The Sun in this Sign was worshipped as the God Ammon.

This recession of Aries from the Equinoctial Point, and its occupation by Pisces has furnished some learned men with curious illustrations, respecting the origin of the Zodiacal Signs, the Mythology of the Greeks, the Egyptians, and Orientalists.

In 365d. 6h. 49mi. the Earth revolves round the Sun, and during its progress in this annual course, it passes through the 12 Signs of the Zodiac successively. Hence we are accustomed to say the Sun is in Aries, Taurus, &c. when in fact it is the Earth that is in those signs, and the Sun, as viewed from the Earth, appears in the opposite part of its orbit.

The *Constellations* are the fixed Stars that lie contiguous to each other, parcelled out into sections of the starry firmament, similar to kingdoms on the Earth; they occupy, in fact, those spaces in the Heavens which they are severally represented to do in our Maps. Hence we can trace the boundaries of any Constellation, and name all its Stars, one by one, as readily as we may name the cities and towns of Great Britain from one of our county maps.

The Stars are named by the letters of the Greek and Roman alphabets, or by a numerical reference; the first letters of the Greek alphabet being used to designate Stars of the 1st, 2d, and 3rd magnitude, Stars of inferior magnitudes are denoted by the remaining letters, and new Stars by the letters of the Roman Alphabet, &c.

The Greek Alphabet.

	Name.	*Sound.*		*Name.*	*Sound.*
α	Alpha	a	ν	Nu	n
β ϐ	Beta	b	ξ	Xi	x
γ ϒ	Gamma	g	ο	Omicron	o *short*
δ	Delta	d	π ϖ	Pi	p
ε	Epsilon	e *short*	ϱ ρ	Rho	r
ζ	Zeta	z	ϛ σ ς	Sigma	s
η	Eta	e *long*	τ	Tau	t
ϑ θ	Theta	th	υ	Upsilon	u
ι	Iota	i	φ	Phi	ph
κ	Kappa	k	χ	Chi	ch
λ	Lambda	l	ψ	Psi	ps
μ	Mu	m	ω	Omega	o *long*

To persons on the Equator, the Stars rise and set perpendicularly; for, to them, the Poles of the world coincide with the Horizon. Each Star is alternately 12 hours above, and as many below, the Horizon.

To persons North or South of the Equator, the Stars all rise and set obliquely. The Pole Star will be seen stationary, as many degrees above the Horizon as are equal to the Latitude; and of the Stars that rise and set daily, those whose Declination North is the greatest, continue the longest time above the Horizon; and those whose Declination South is greatest, the shortest time. Some skirt the southern Horizon, and then disappear.

Were there inhabitants at the Poles of the Earth, they would see the Stars move round in circles parallel to the Horizon, which to them coincides with the Equator. The Stars in that Hemisphere, whose Pole is the Zenith, never go below, those in the opposite Hemisphere never appear above, the Horizon.

Those Stars that have, at any time, the same Right Ascension with the Sun, come to the Meridian at the same time with that body; and the other Stars come to the Meridian before or after the Sun, according as they lie to the west or east of his place. But, from the Earth's annual motion in its orbit round the Sun, the Sun appears to advance eastward among the Stars, at the rate of nearly 1° per day: one degree being equal to 4 minutes of time, this causes the Stars to come to the Meridian, on any day, 4 minutes sooner than on the day preceding. Those Stars that are on the Meridian at midnight will, the next night, be on it 4 minutes before 12; in 2 nights, 8 minutes, &c. From this cause, if the Heavens be viewed at the same hour of any two days, at the distance of 6 months from each other, a new assemblage of Stars (with the exception of those that never go below the Horizon) will be presented to the eye.

A revolution of one year bringing the Sun exactly into the same situation, with respect to the Stars, as it was on the same day of a former year,—on the same day of any year the same Stars will always come to the Meridian at the same time. Having the hour given at which any Star comes to the Meridian, the day may consequently be found. The altitude and azimuth of any Star will vary with the Latitude, the day of the month, and the hour of the day; and, from having any three of these terms, the other two may be found. The hour of the night may be known at any time, by finding when any two Stars have the same azimuth. These facts furnish us with data for the solution of such Problems as it may be convenient to propose in this Atlas.

A Solar Year, or tropical year, is the time which the *Sun* takes in passing through the Ecliptic, from one Tropic, or Equinox, till it returns to it again: and consists of 365 days, 5 ho. 48′ 48″.

A Sidereal Year is the time which the Sun takes in passing from any fixed Star, till he returns to it again, and consists of 365 days, 6 ho. 9′ 12″; the

sidereal year is therefore 20′ 24″ longer than the tropical year, and the Sun returns to the Equinox every year before he returns to the same point of the Heavens; because the Equinoctial Points retrograde.

A *Paratanellon* is a Star, or Constellation, rising either beside a Sign, or opposite to it.

The Oriental Astronomers divided each Sign of the Zodiac into three parts, called *decans*, which amounted to 36 for the whole zodiacal circle. The Constellations or Asterisms on both sides of the Zodiacal Circle were considered as connected with these Decans. There was consequently a division of these extra Zodiacal Constellations, amounting to 36, the number of the Decans. Now the extra Zodiacal Stars, on each side of a Decan, and which rise above the Horizon, or sink below it, during the time that Decan takes to rise or set, are its *Paratanellons*. We shall consider, however, as a Paratanellon, the whole Constellation rising beside a Sign.

The *curved* lines going from the upper to the lower parts of the particular Maps, are the Meridians drawn from hour to hour, or from 15° to 15° of the Equator and its parallels.

These lines shew the distance of the Stars from the first point of Aries, reckoning from the West to the East, i. e. *Eastward* all round the Equinoctial. This distance we define as their *Right Ascension*, in time or in degrees. The first of these ascensions is marked at the top and base of each Map, from 20 to 20 minutes; the second is divided into degrees, and marked from 5 to 5. The spaces 20, 40, 60, divide each hour into three convenient portions, for easy reference. And the division of these spaces into 5 subdivisions each, give us 15° for the hour.

The *parallel* lines shew the *declinations* of the Stars; they are drawn through every 5th degree, and the individual degrees are again subdivided into 4 parts, each of which contains 15 minutes.

The degrees of *declination* indicated on the right and left hand sides of the Maps, preserve the same magnitude on all the Maps; but those of *right ascension* become less, on every successive parallel, as we go from the Equator towards the Poles.

On all the Maps the upper edge is N.; the lower S.; the right hand side is W.; the left hand side E.

The *dotted* lines, or arcs, are either Meridians or Parallels of the Ecliptic, which shew the Long. and Lat. of the fixed Stars; they are described through every 10th degree, and are marked 10°, 20°, &c.

When the Latitudes and Longitudes of the Stars are reckoned by the Ecliptic, these parallels and circles of Longitude will be of use. And where the Ecliptic itself is not met with, the degrees of Lat. and Long. are marked from 10° to 10°, at the extremity of the lines, at the top or bottom, or at the sides of the Map.

The 1st, 28th, and 29th Maps, are universal Planispheres, presenting Stereographic Projections of the Heavens for the present time. The North Pole is the centre of the Map, the Equator is its extremity, in Maps 1 and 28. On the Equator the Right Ascension in time and in degrees is marked, and the Declination by concentric circles to the North Pole. The Declination is found from the *quadrant of altitude* drawn from the centre to XXIV hours. At this point (0° ♈) the Right Ascension commences in time and degrees, going round the perephery I, II, III, &c.; or 15°, 30°, 45°, &c. But not to multiply the lines on these Maps 1 and 28, the hour circles, which are all right lines, have been omitted, except the Colures or Meridians, from ♈ to ♎, and from ♋ to ♑. But the circles of Longitude and Latitude are represented by dotted arcs and circles drawn through every 10th degree. The former are drawn from the Pole of the Ecliptic to the Perephery of the Map; the latter are drawn concentrically to that Pole. Each of the Planispheres presents one half of the Ecliptic, and the Polar circles and Tropics at 23°½ and 66°½ from the Poles.

Map II, and its successors to Map XXVIII, follow one another, according to three great divisions of the Constellations.

The 2nd Map which represents the Constellations adjacent to the Arctic Pole of the World, is traced agreeably to the Stereographic Projection, and in this respect it differs from the others, which are approximations of the Projection of the Sphere on a plane.

From the 1st Map to the 13th, a general representation of the N. Hemisphere is given, including all the Constellations between the Zodiac and the N. Pole.

From the 13th to the 23d Map, the Signs of the Zodiac are included.

From the XXIII Plate to the XXVIII, are contained the S. Constellations, embracing 38° S. Declin.

The 28th Map completes the Atlas, presenting the Constellations in the Southern Hemisphere.

The 29th exhibits a triangulation of the principal Stars which appear in the Horizon of London.

The 30th, the Moon, Venus, Jupiter, and Saturn.

The principal Constellations on each Map are shaded to distinguish them more effectually, and their names are written in capital letters. The neighbouring Constellations, on the contrary, are marked by a mere outline of their figures, and their names are written in a smaller letter. The magnitudes of the Stars have been observed in the Engraving with all the care possible; but it was deemed unnecessary to crowd the Map with numerical references, as the Catalogues of Stars to each Map contain only those that are named alphabetically.

After mature deliberation, and consulting my friend Mr. Harris, the optician, in Holborn, I have not thought it advisable to describe any astronomical instruments, because the details to which their introduction would lead, seldom convey an adequate idea of their use to persons who have not been in the habit of seeing and using them.

The following is the order of the Maps, with the names of the principal Constellations which each represents:

		Plate A to face Page
Map I.	Northern Hemisphere	3
II.	Ursa Minor, Cassiopeia, Tarandus, Cepheus, Draco, and Custos Messium	17, 18
III.	Andromeda, Perseus and Caput Medusæ, Triangula, and La Gloire de Frederic	19, 20
IV.	Auriga, Camelopardalis, and Telescopium Herschelii	21, 22
V.	Lynx and Leo Minor	23
VI.	Ursa Major	24
VII.	Böotes and Mons Mænalus, Asterion and Chara, or Canes Venatici, Coma Berenices, and Quadrans Muralis	25, 26
VIII.	Corona Borealis, Hercules and Cerberus, Lyra	27
IX.	Ophiuchus, or Serpentarius, and Serpens	29
X.	Aquila and Antinöus, Scutum Sobieski, Taurus Poniatowski, Sagitta, Vulpecula and Anser, Delphinus	30, 31
XI.	Cygnus, Lacerta, and Via Lactea	32
XII.	Pegasus, and Equuleus	33, 34
XIII.	Aries, and Musca Borealis	35
XIV.	Taurus	36
XV.	Gemini	37, 38
XVI.	Cancer	39
XVII.	Leo	40, 41
XVIII.	Virgo	42, 43
XIX.	Libra and Scorpio	44, 45
XX.	Sagittarius	46
XXI.	Capricornus and Aquarius	47, 48
XXII.	Pisces	50
XXIII.	Cetus, Officina Sculptoris, Machina Electrica, Fornax Chemica	51
XXIV.	Eridanus, Orion, Lepus, Columba, Cela Sculptoris, Psalterium Georgii, Horologium, Brandenburgium Sceptrum	52
XXV.	Canis Major, Canis Minor, Monoceros, Argo Navis, l'Atelier de l Imprimeur	56
XXVI.	Hydra, Sextans Uraniæ, Le Chat, La Machine Pneumatique	60
XXVII.	Hydra Continua, Crater, Corvus, Centaurus and Lupus	61
XXVIII.	The Southern Hemisphere	62
XXIX.	The Principal Stars visible in Great Britain	63
XXX.	The Moon, Venus, Jupiter, and Saturn	ib.

In the following Treatise on the Manner of Using the Maps, I have in one or two instances assumed 51½° as the Latitude of London, for the greater convenience of working the Examples; and this nearly corresponds with the mean Latitude between St. Paul's and the Observatory of Greenwich.

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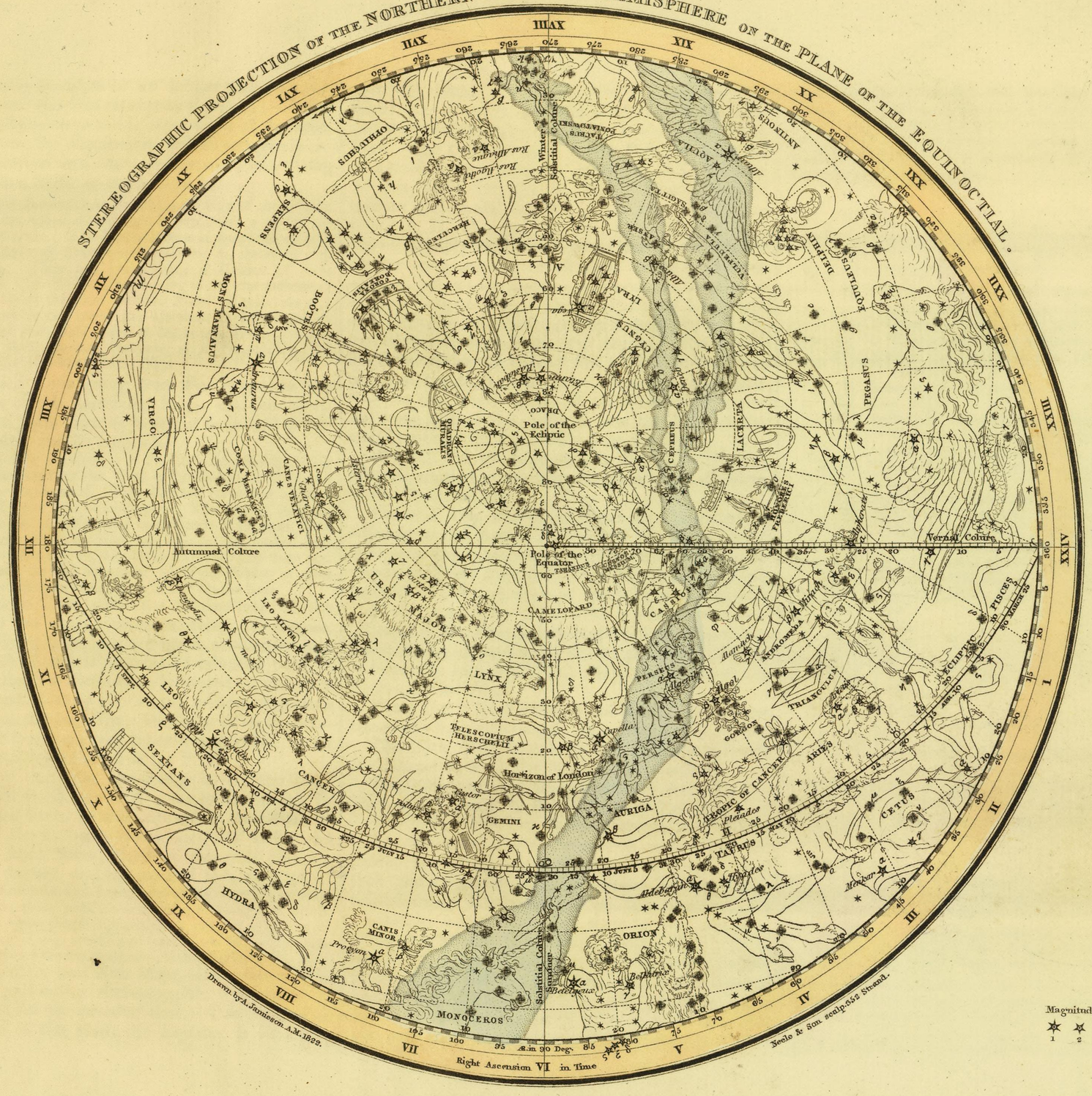
STEREOGRAPHIC PROJECTION OF THE NORTHERN CELESTIAL HEMISPHERE ON THE PLANE OF THE EQUINOCTIAL.



Magnitudes of the Stars.

1 2 3 4 5

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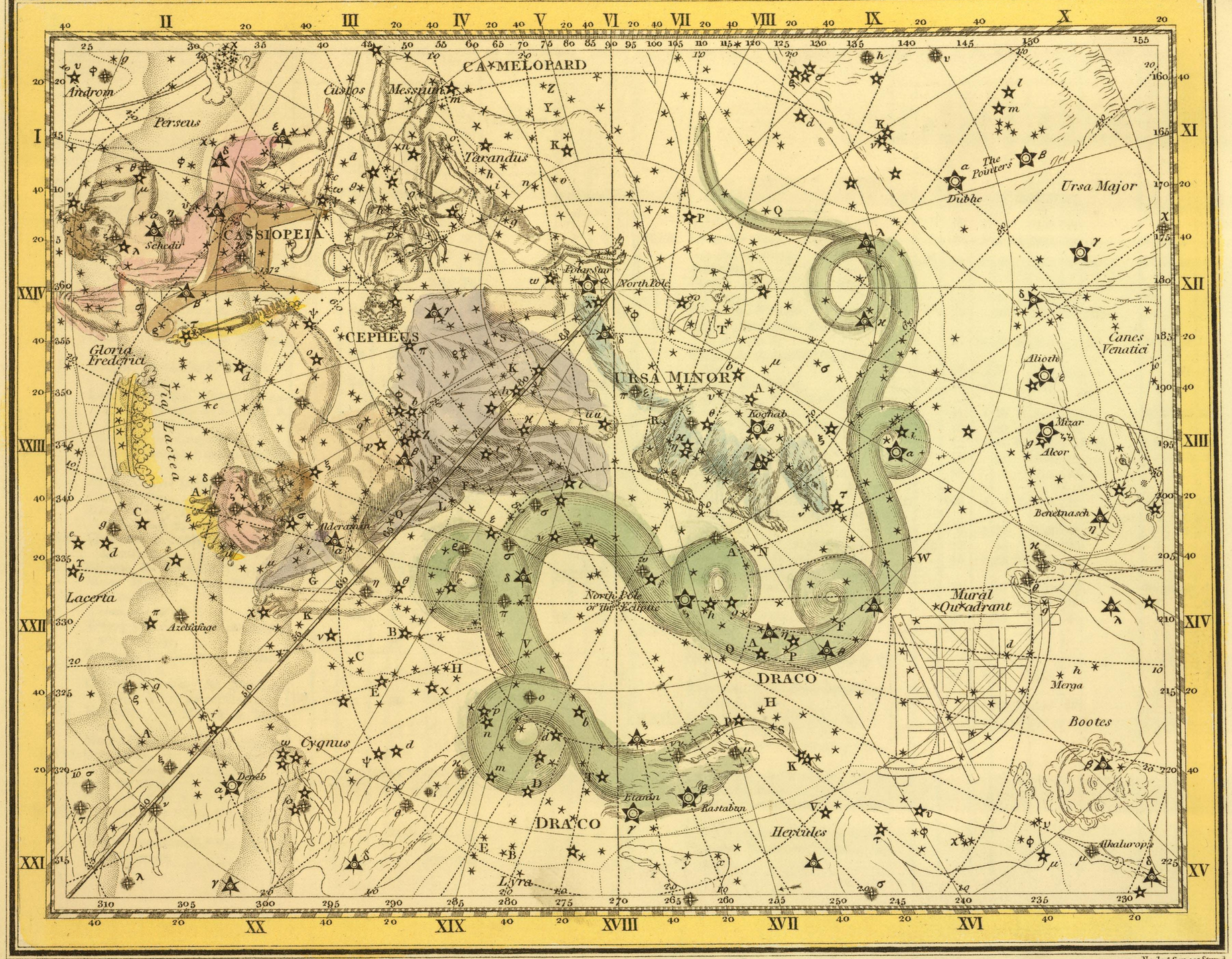

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Magnitude of the Stars 1 2 3 4 5 6 7 8 9 Clusters of Stars Nebulæ Nebulous Star New Star

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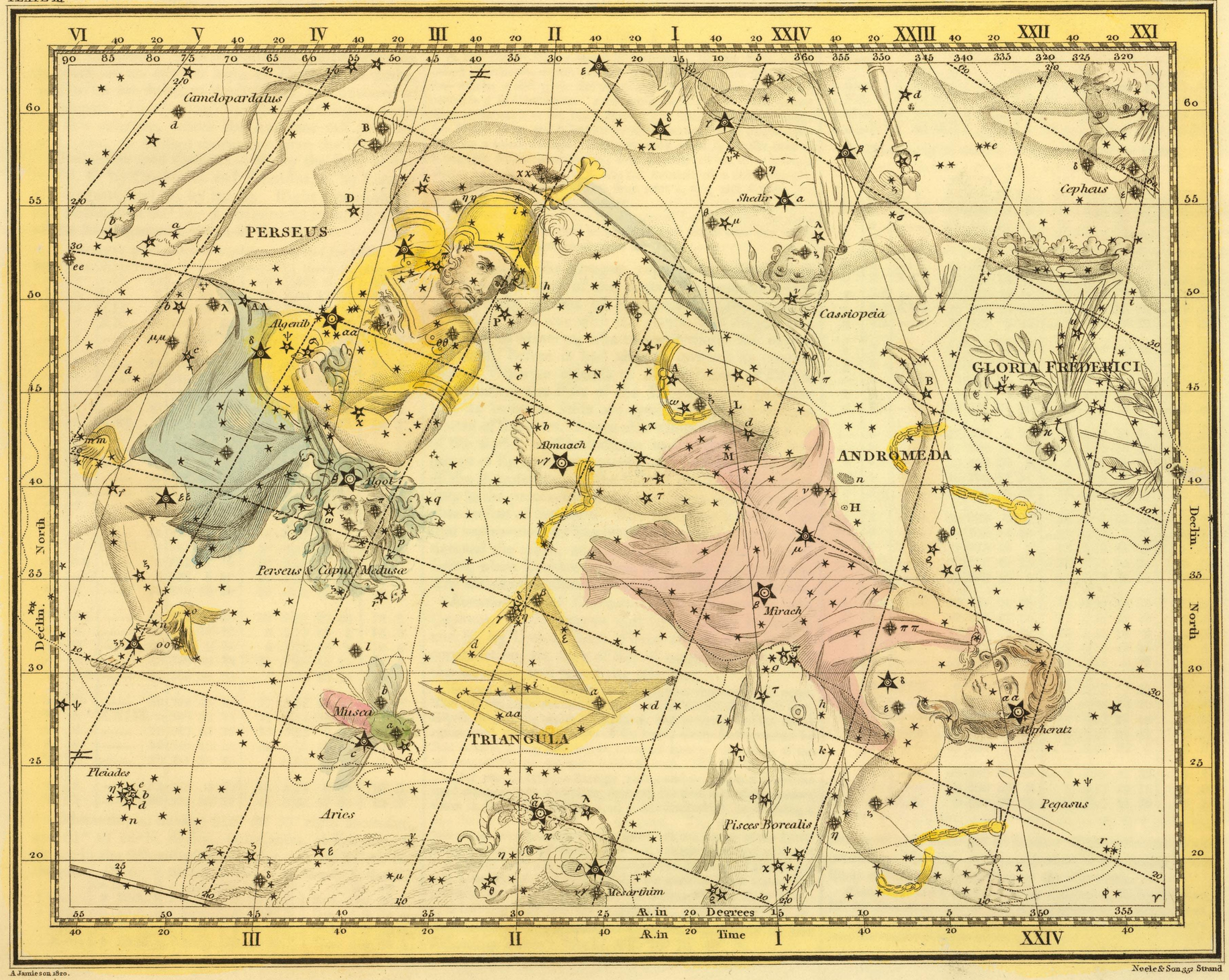

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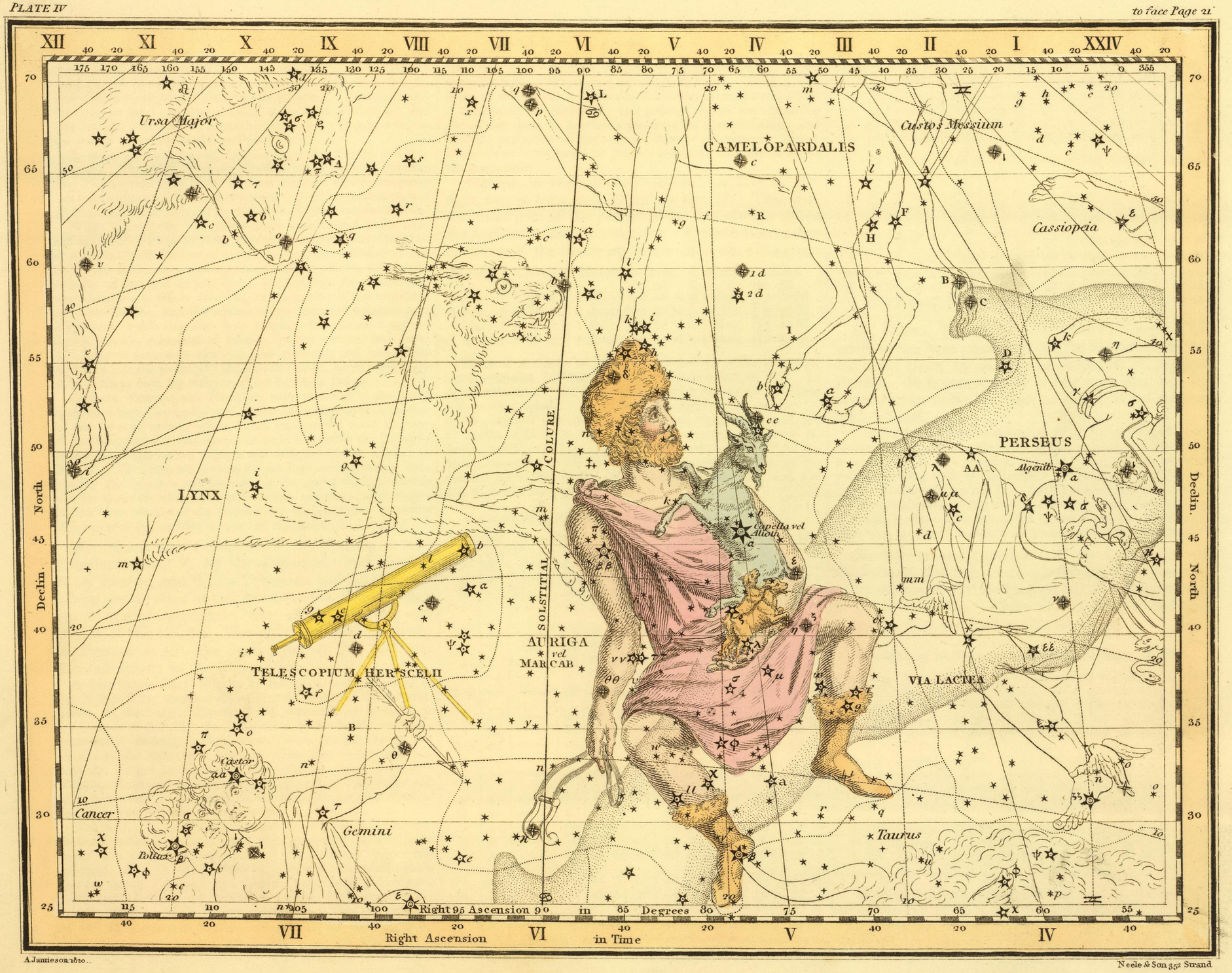

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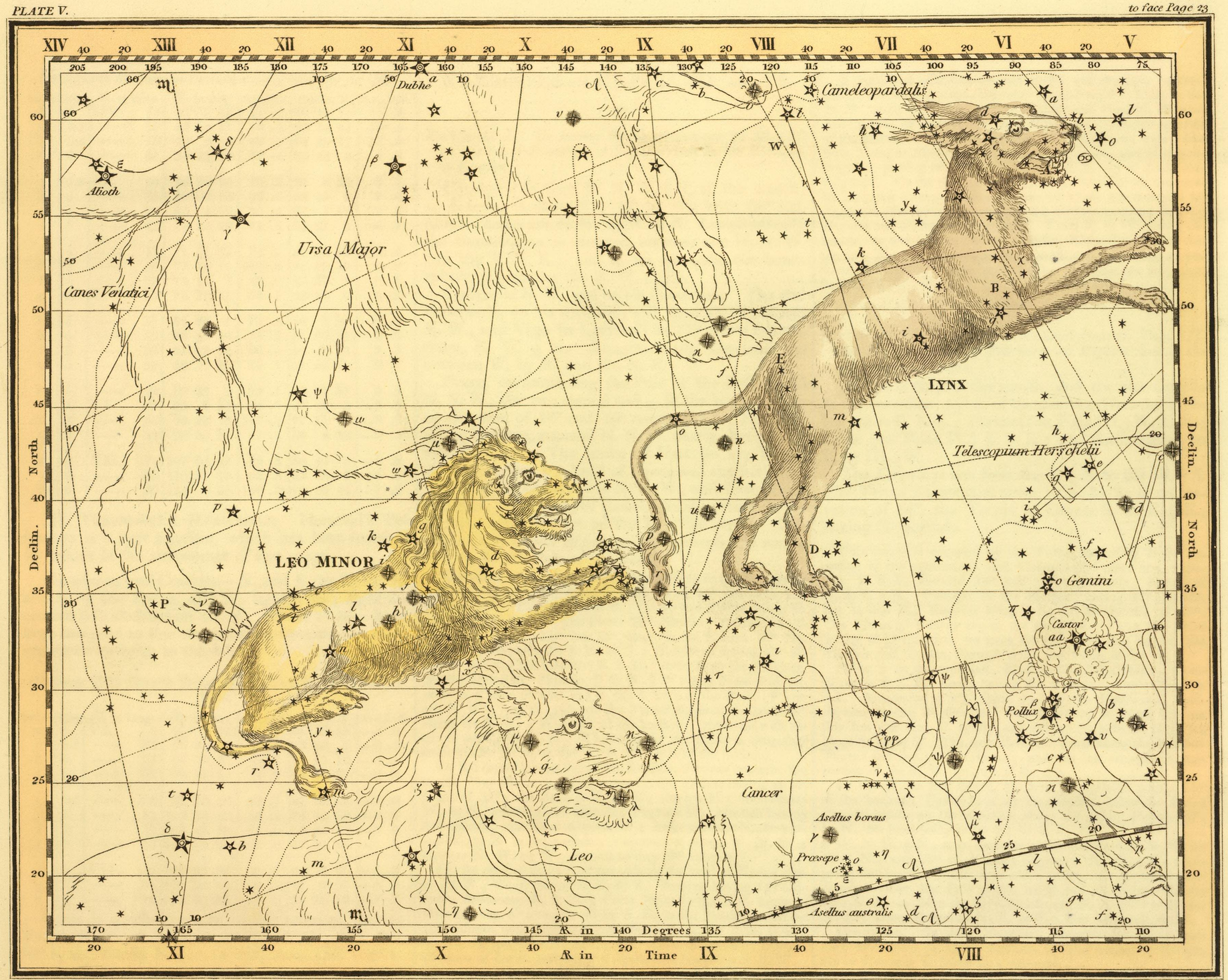

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URSA MAJOR

Ursa Minor

Draco

Camelopardalis

Canes Venatici

Asterion

Chara

Coma Berenices

Leo Minor

Lynx

Cancer

Dubhe

The Pointers

COLURE

Mizar

Alioth

Alcor

Benetnasch

Cor Caroli

North Declin.

R. in Degrees

R. in Time

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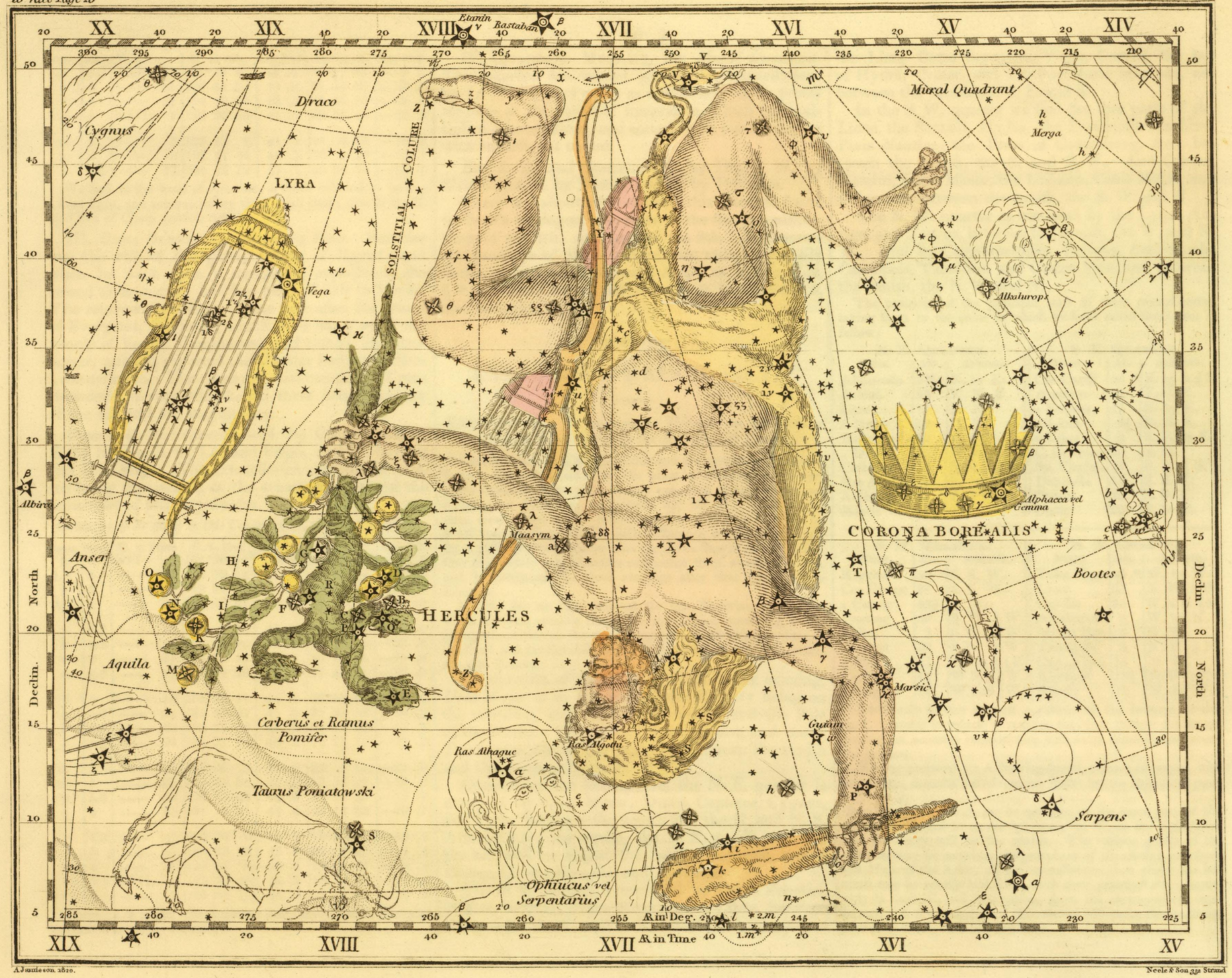

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PLATE IX

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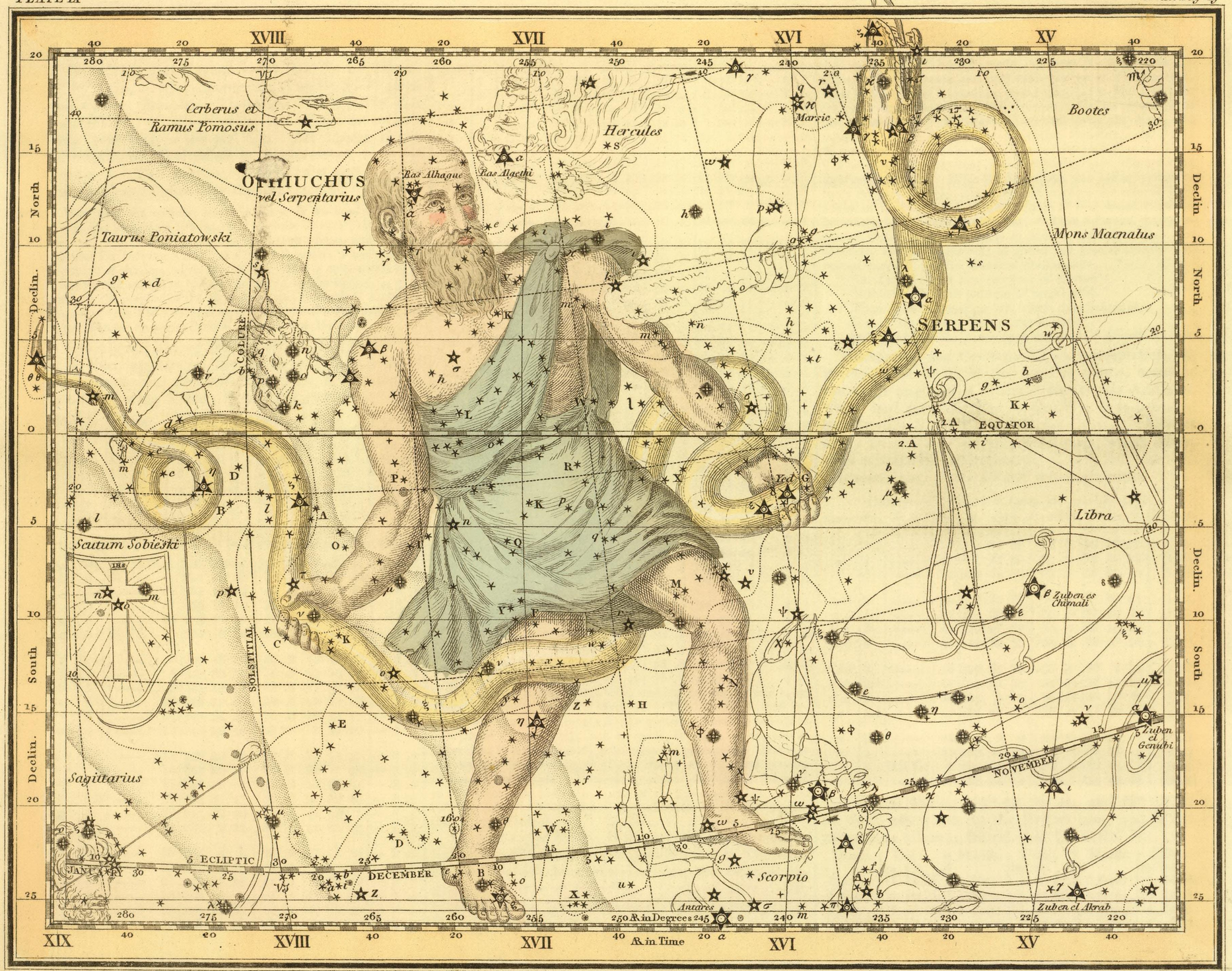

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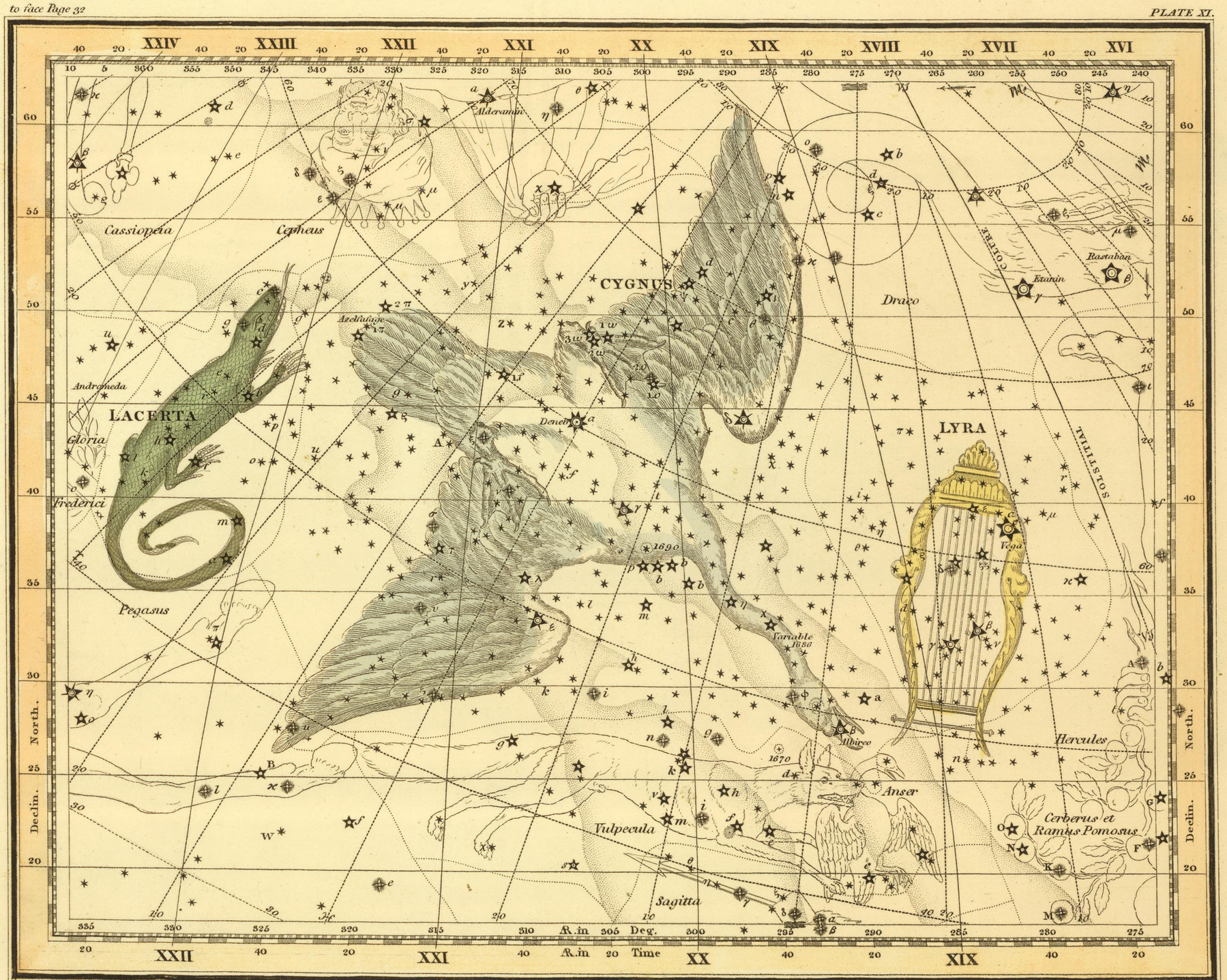

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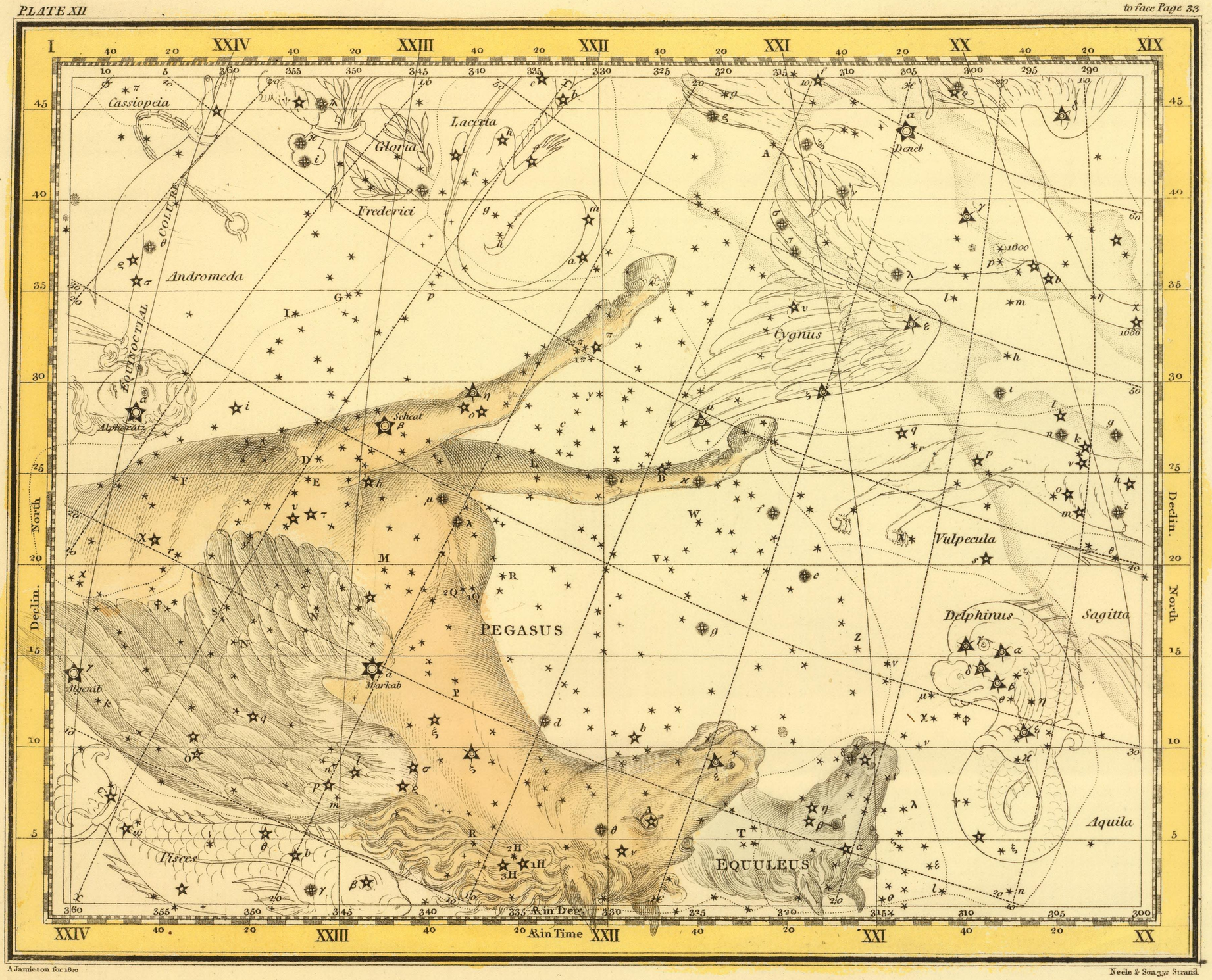

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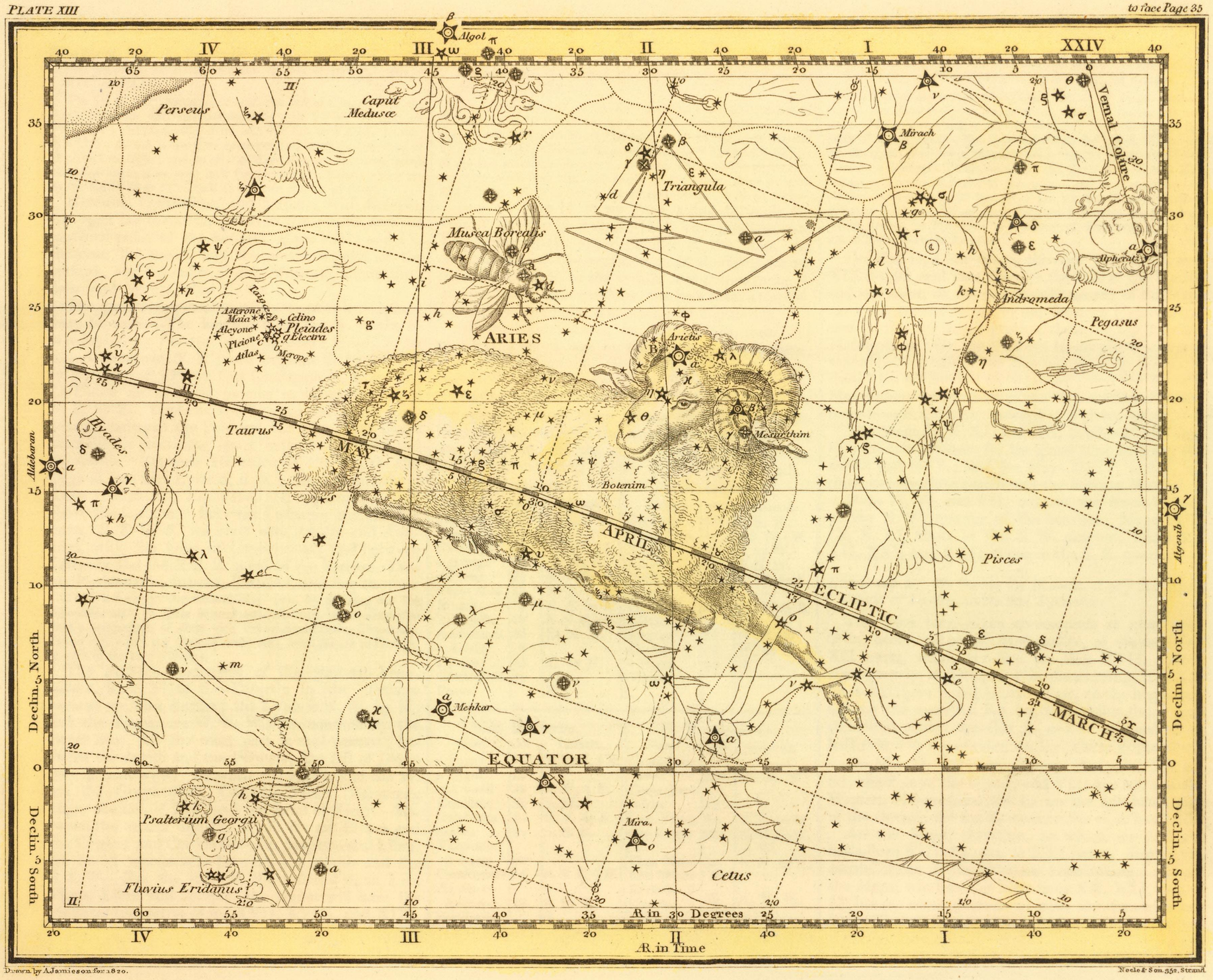

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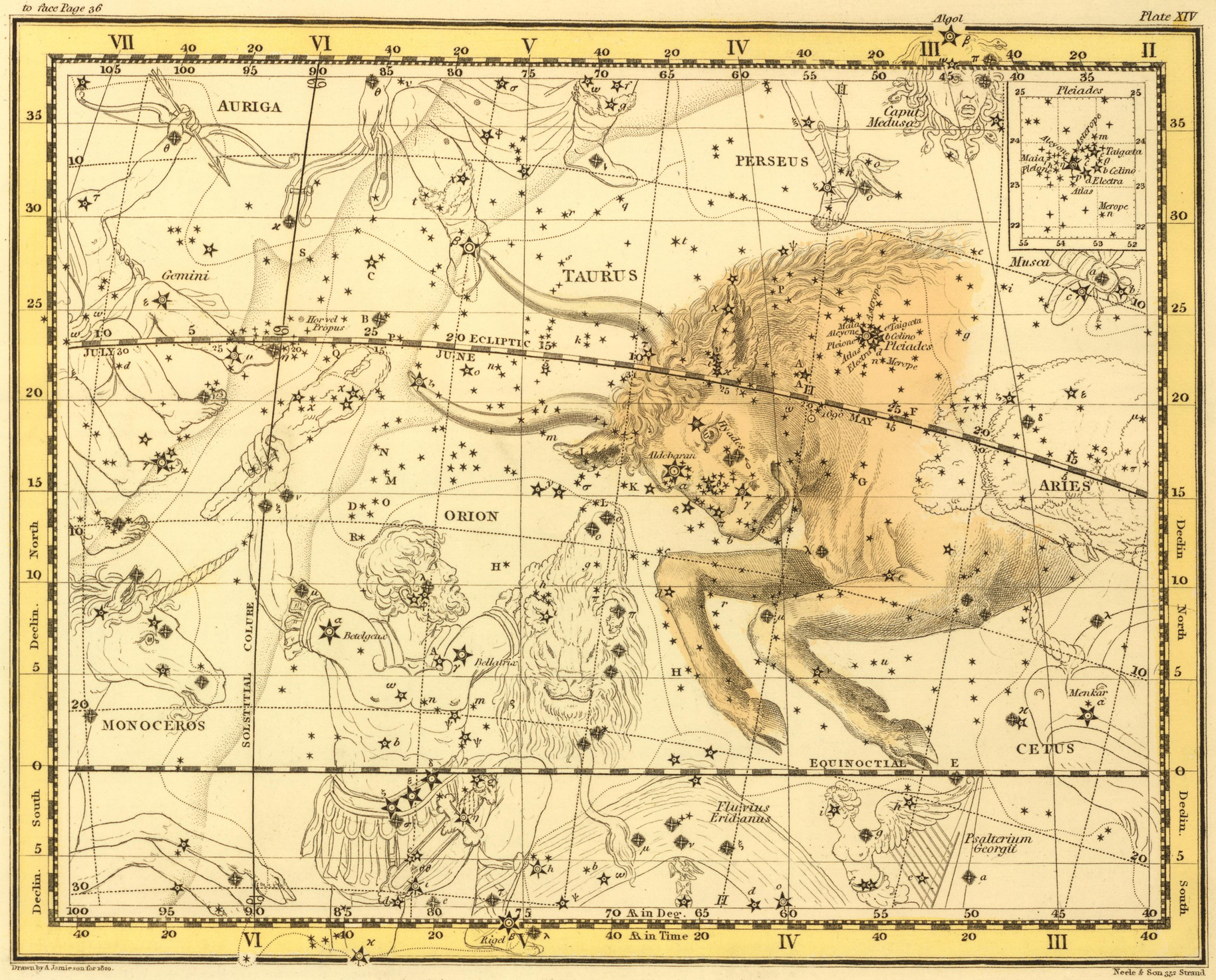
Plate XIV



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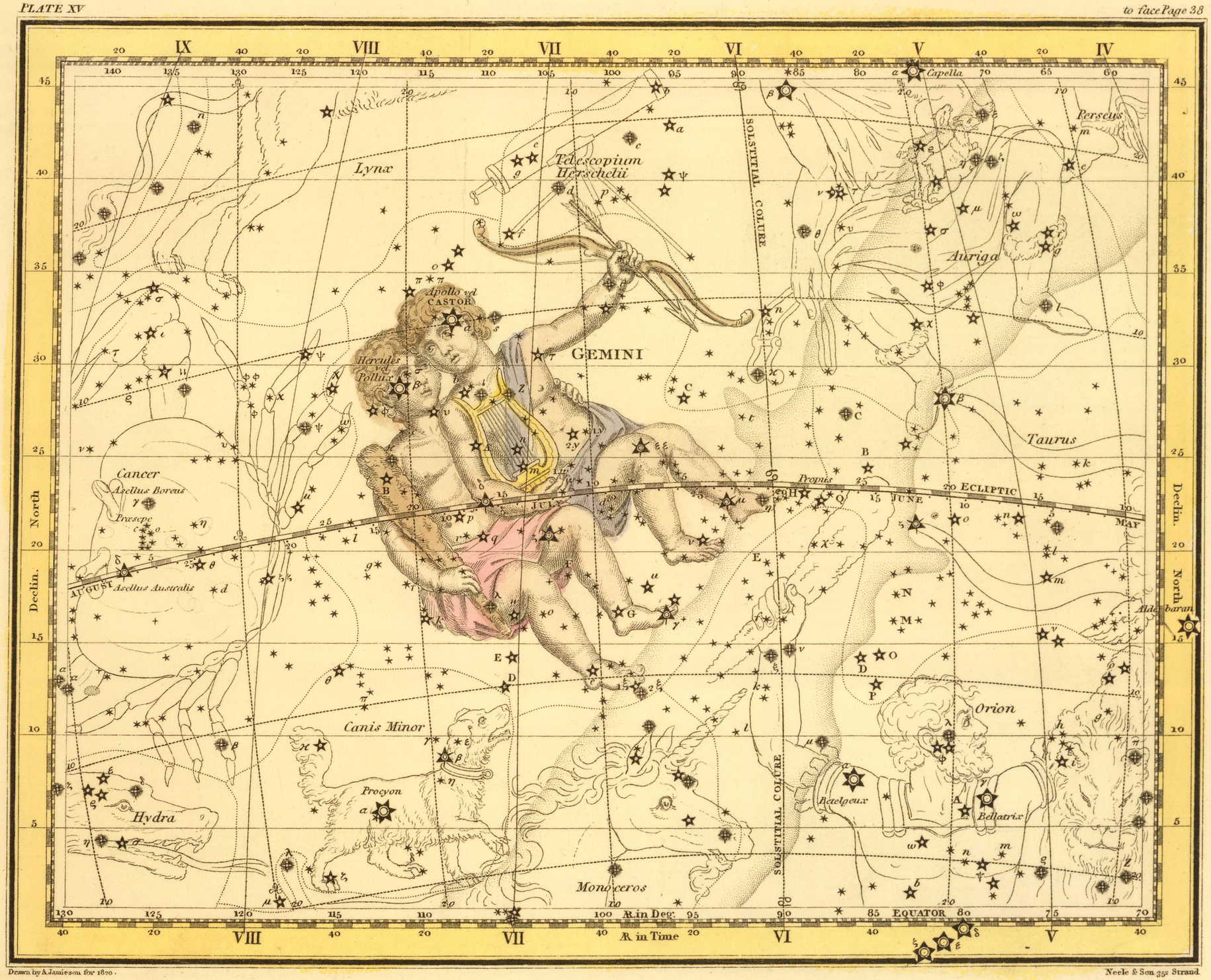

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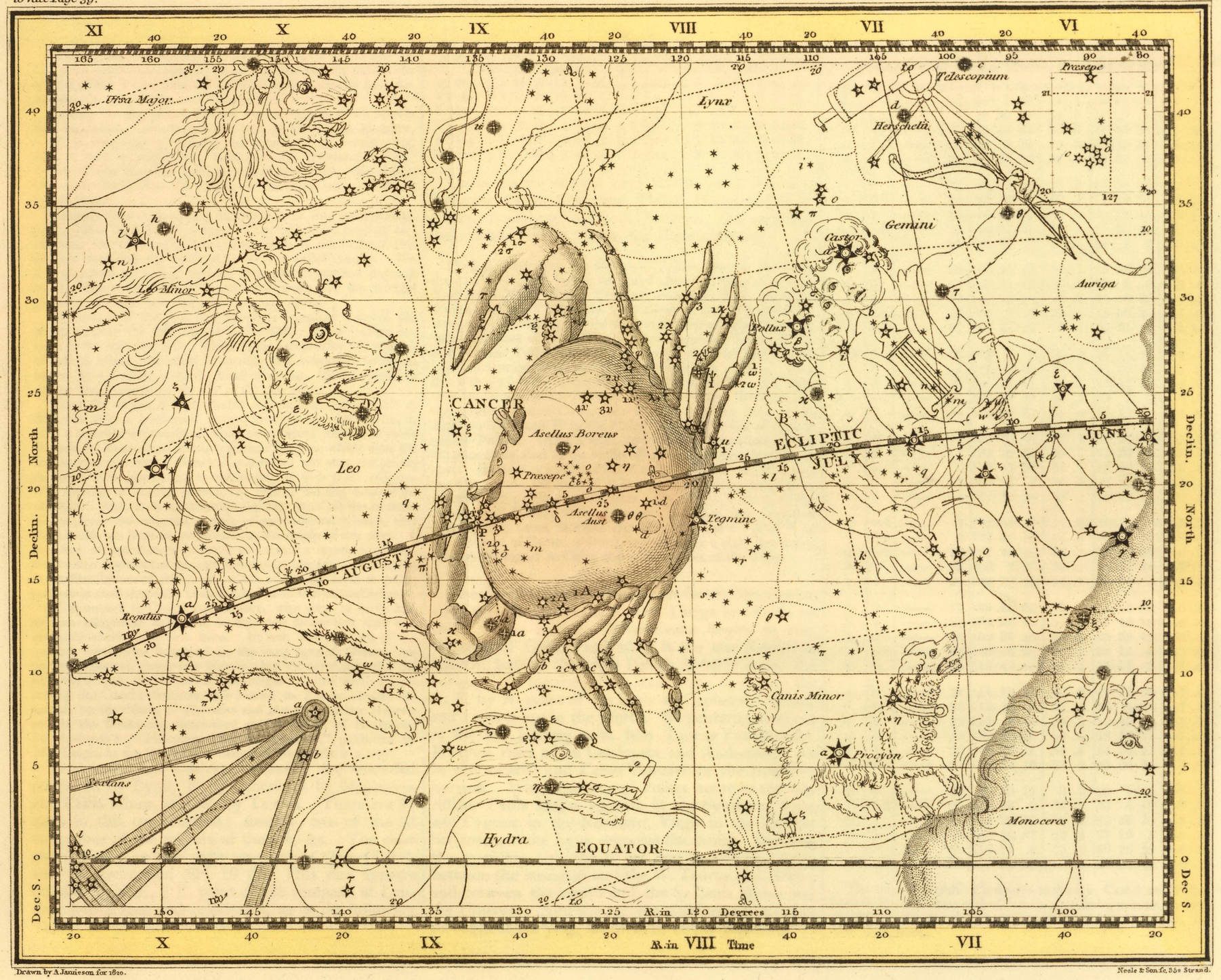

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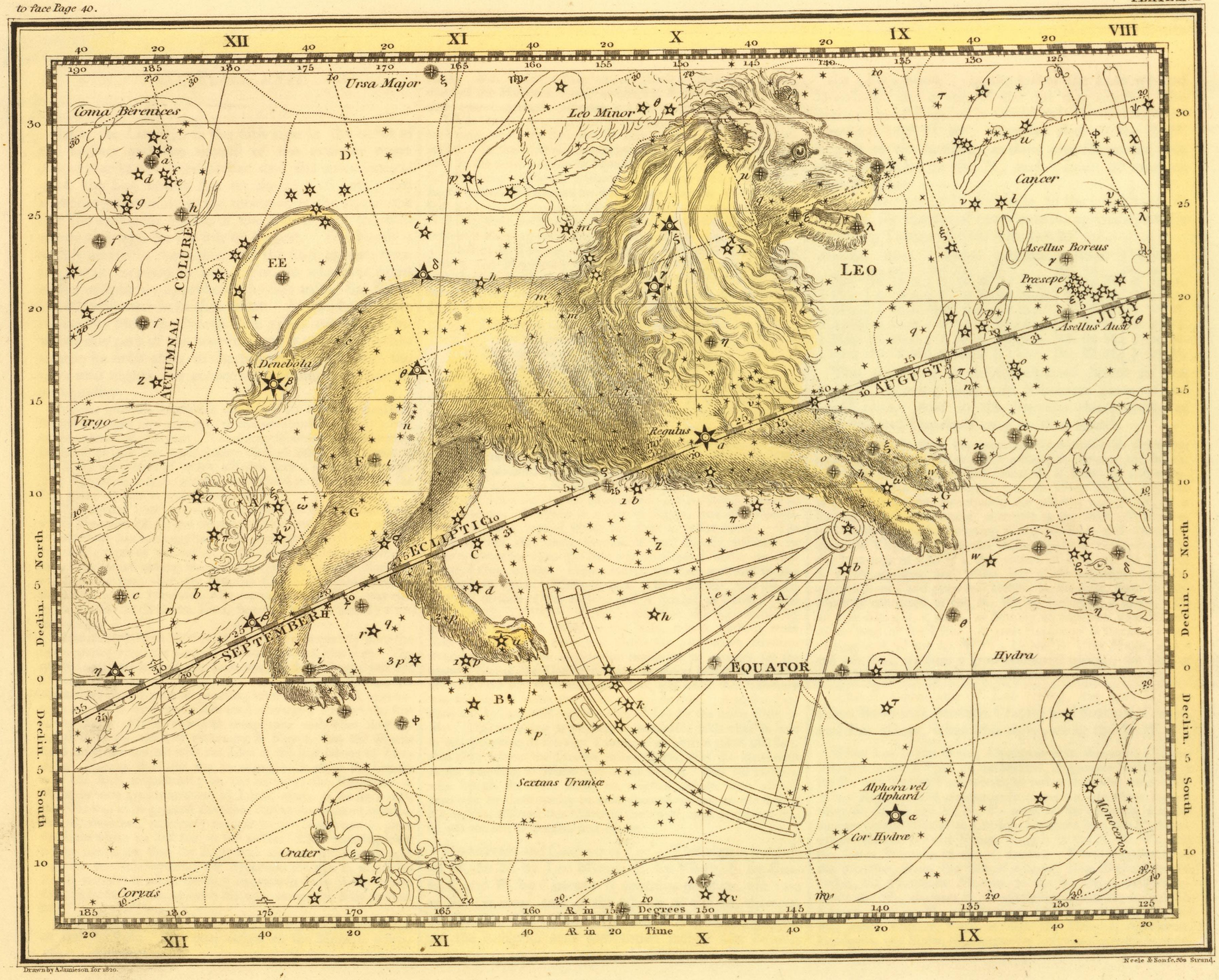

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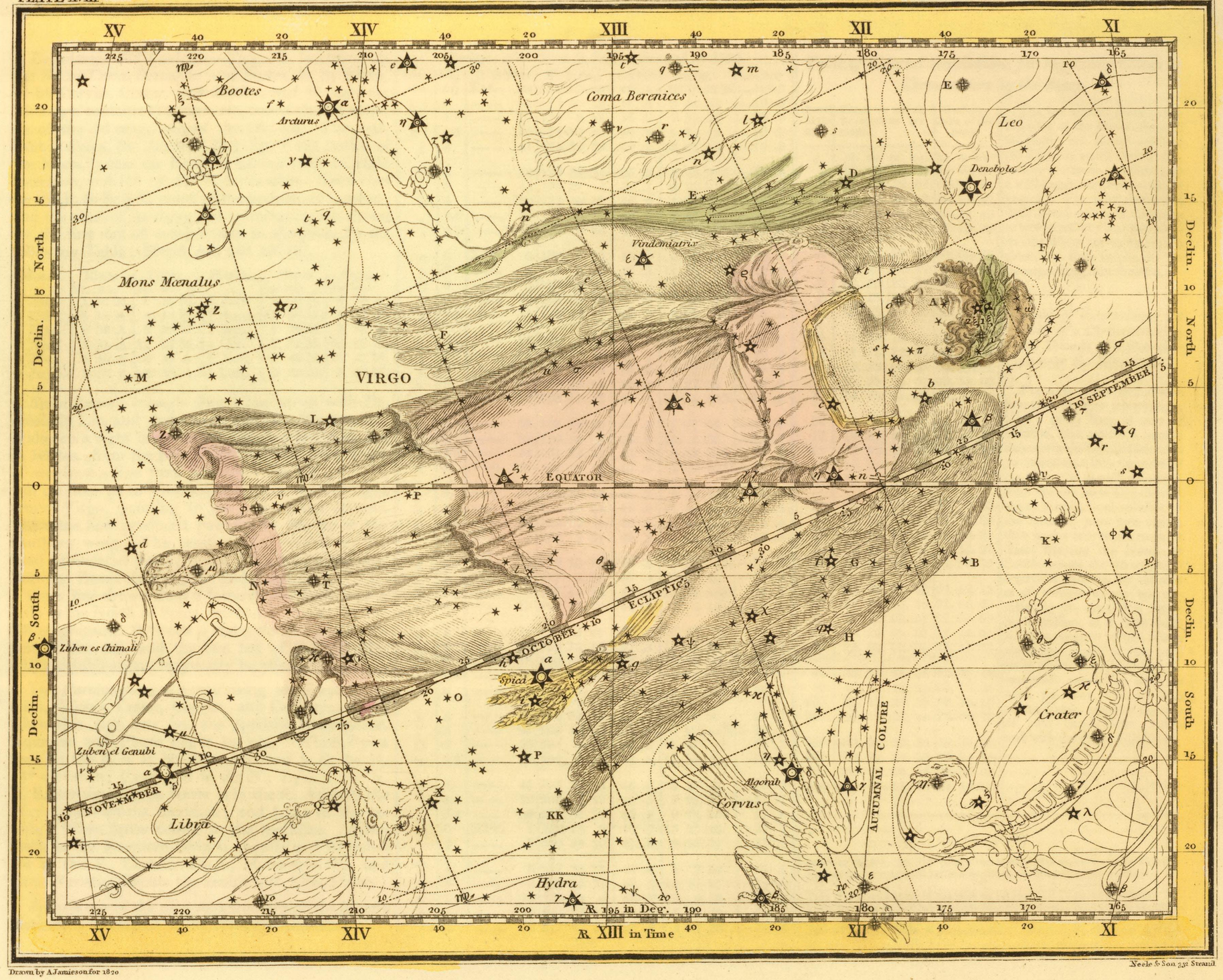

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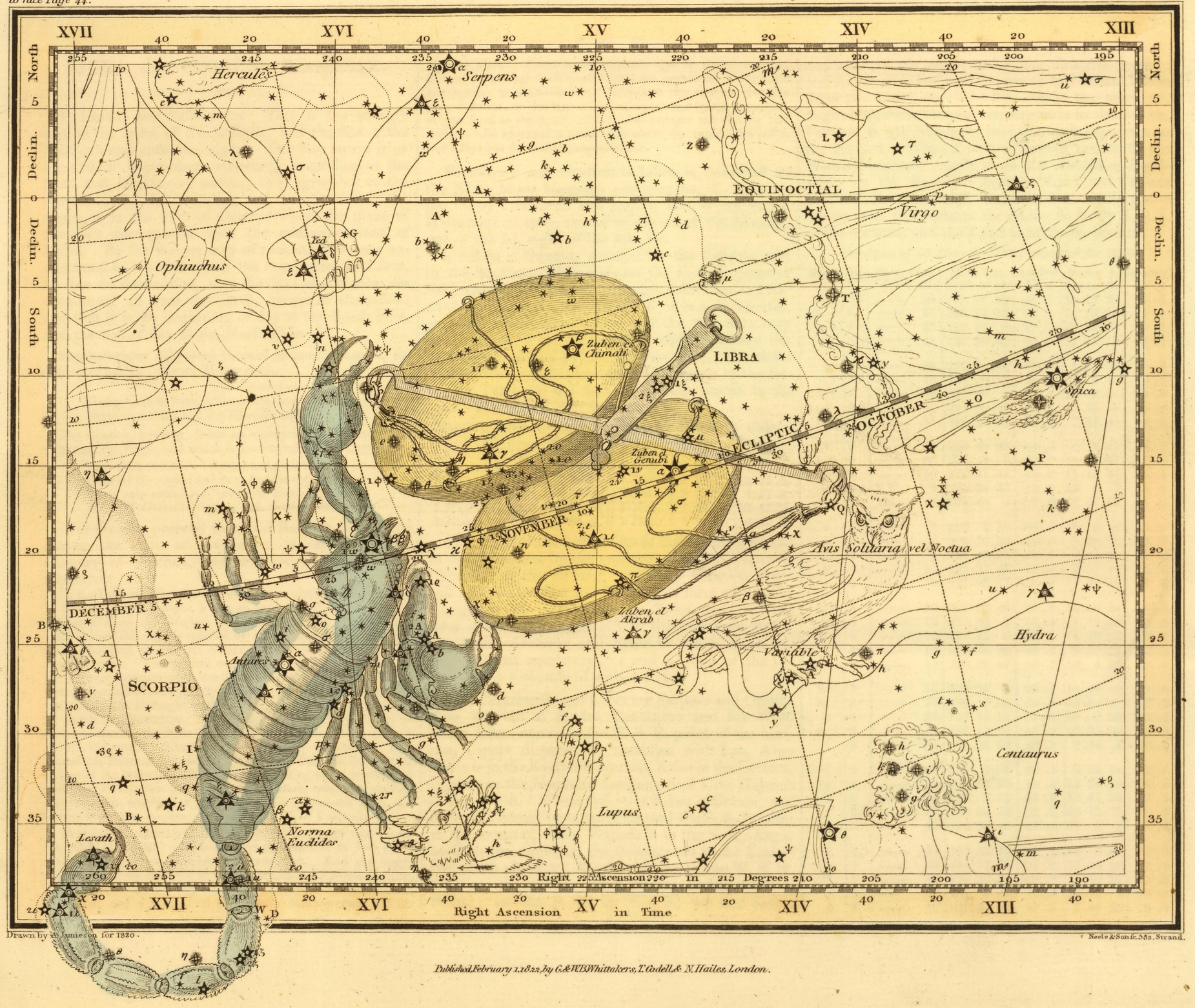

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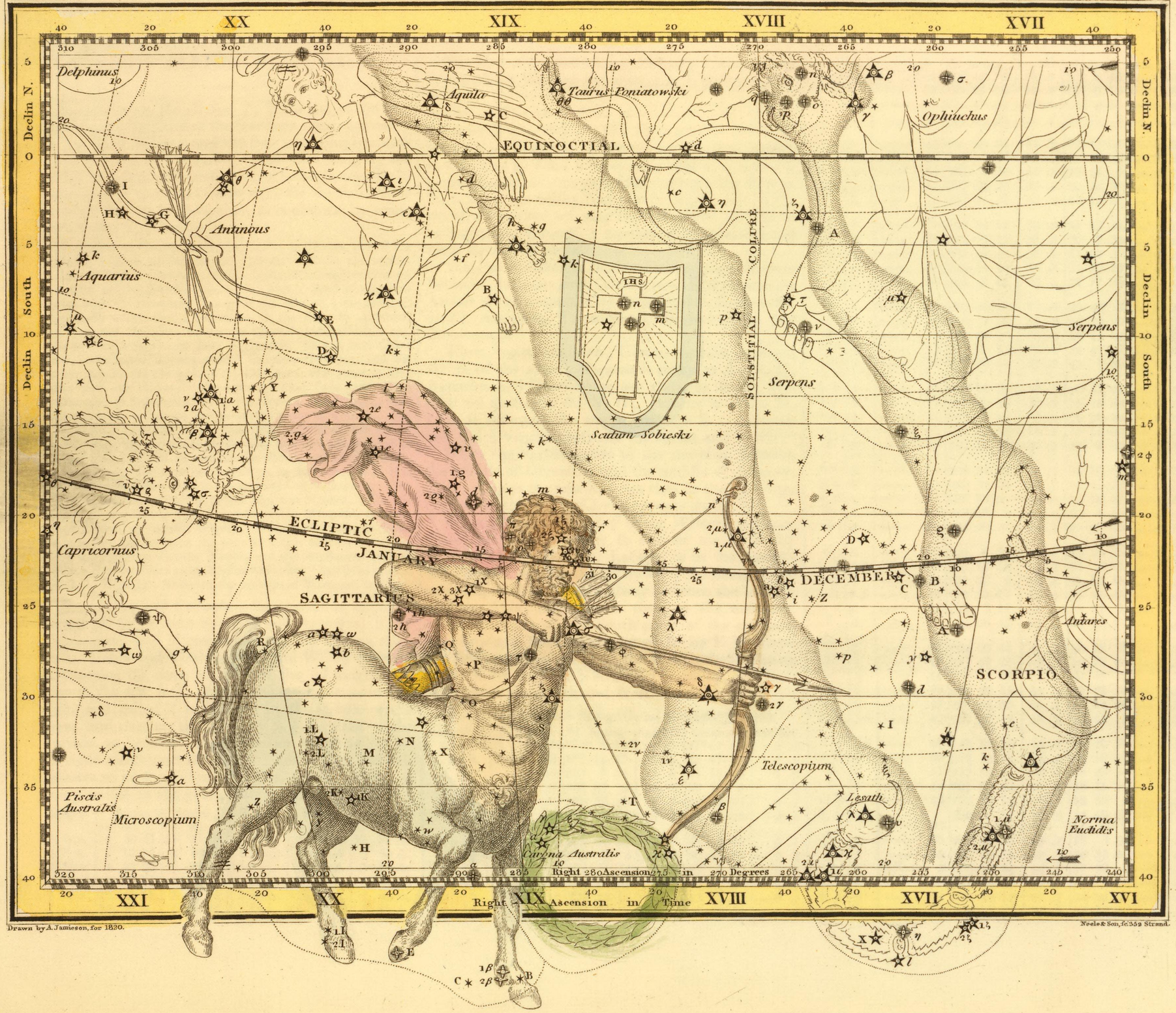

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PLATE XXII

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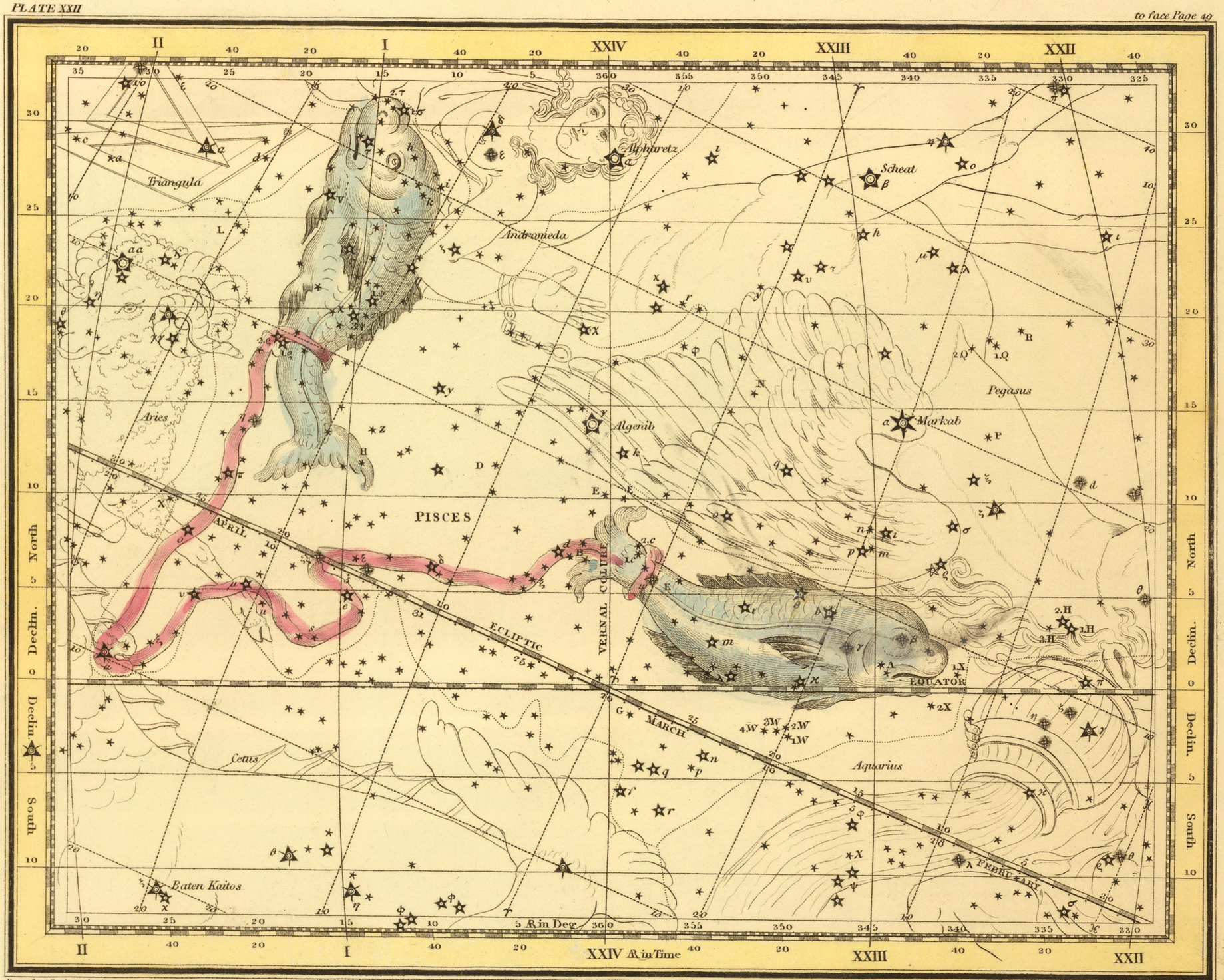

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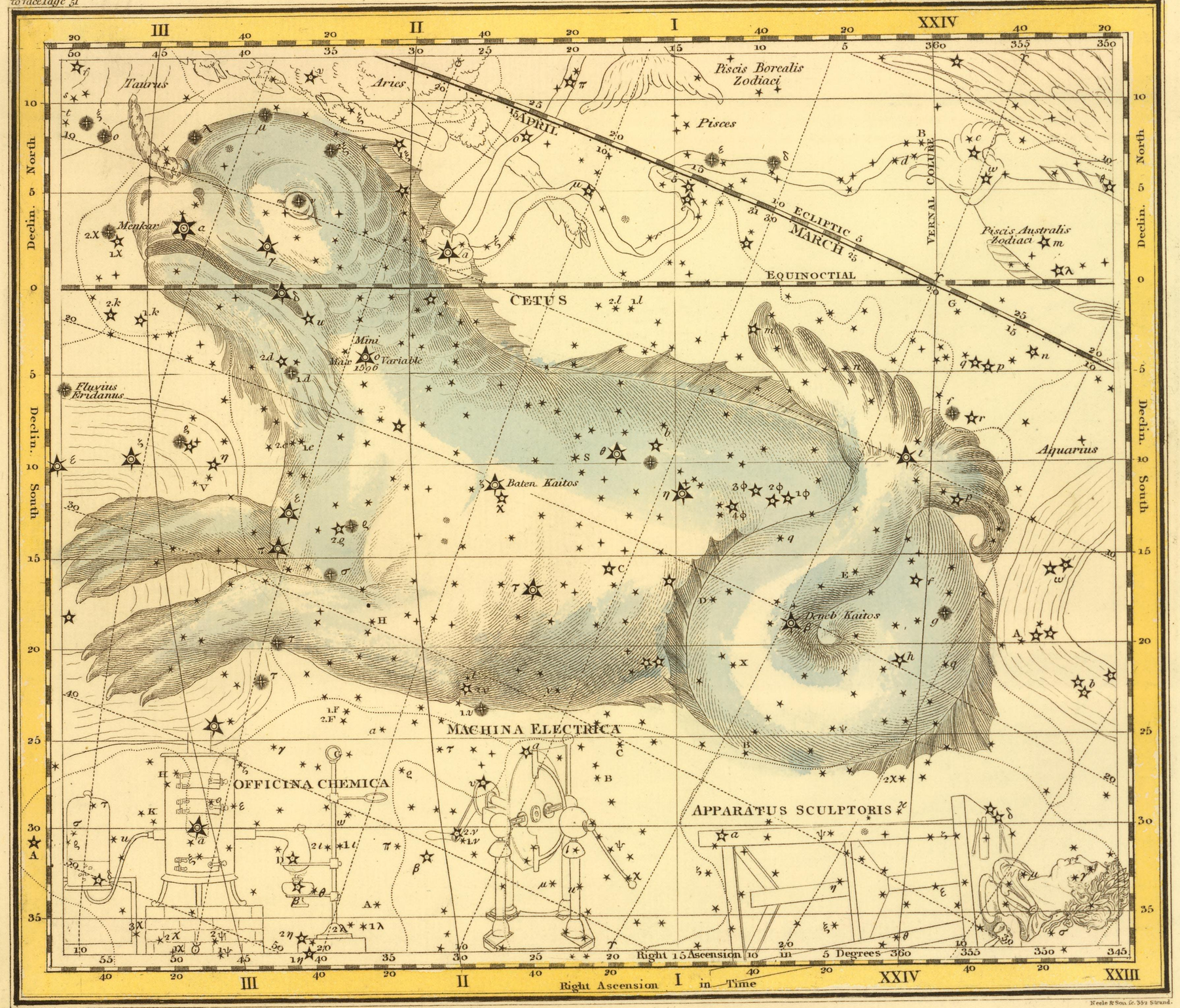

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a Aldebaran

to face Page 53.

VI V IV III

Declin. 5 North

Declin. 5 South

ORION

COLURE SOLSTITIAL

Betelgeux

Bellatrix

Rigel

Sirius

LEPUS

Canis Major

COLUMBA NOACHI

CELA SCULPTORIS

SCEPTRUM BRANDENBURGIUM

Taurus

Menkar

EQUATOR

Cetus

PSALTERIUM GEORGII

FLUVIUS ERIDANUS

FORNAX vel Fornais

CHEMICA la Caille

Right Ascension in Time

Right Ascension in Degrees

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PLATE XXV

CANIS MINOR
Procyon
MONOCEROS
Hydra
ORION
Betelgeux
Bellatrix
EQUATOR
CANIS MAJOR
Sirius
Lepus
Rigel
COLUMBA NOACHI
ARGO NAVIS
Markab
PYXIS NAUTICA
L'ATELIER Du Il Imprimeur
MAGNA CHARTA
SOLSTITIAL COLURE
Declin North
Declin South
Right Ascension in Time
Right Ascension in Degrees

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SEPTEMBER

Leo

Virgo

SEXTANS

CRATER

HYDRA

Cor Hydræ
vel
Alphard

Monoceros

MAGNA CHARTA

Machina Typographia

Corvus

PELIS

FYXIS NAUTICA

ARGO NAVIS

ANTLIA PNEUMATICA

Centaurus

XI X IX VIII

XII XI X IX VIII

Declin. North 5 0 5 10 15 20 25 30 35 Declin. South

Right Ascension in Time

Right Ascens.n in Degrees

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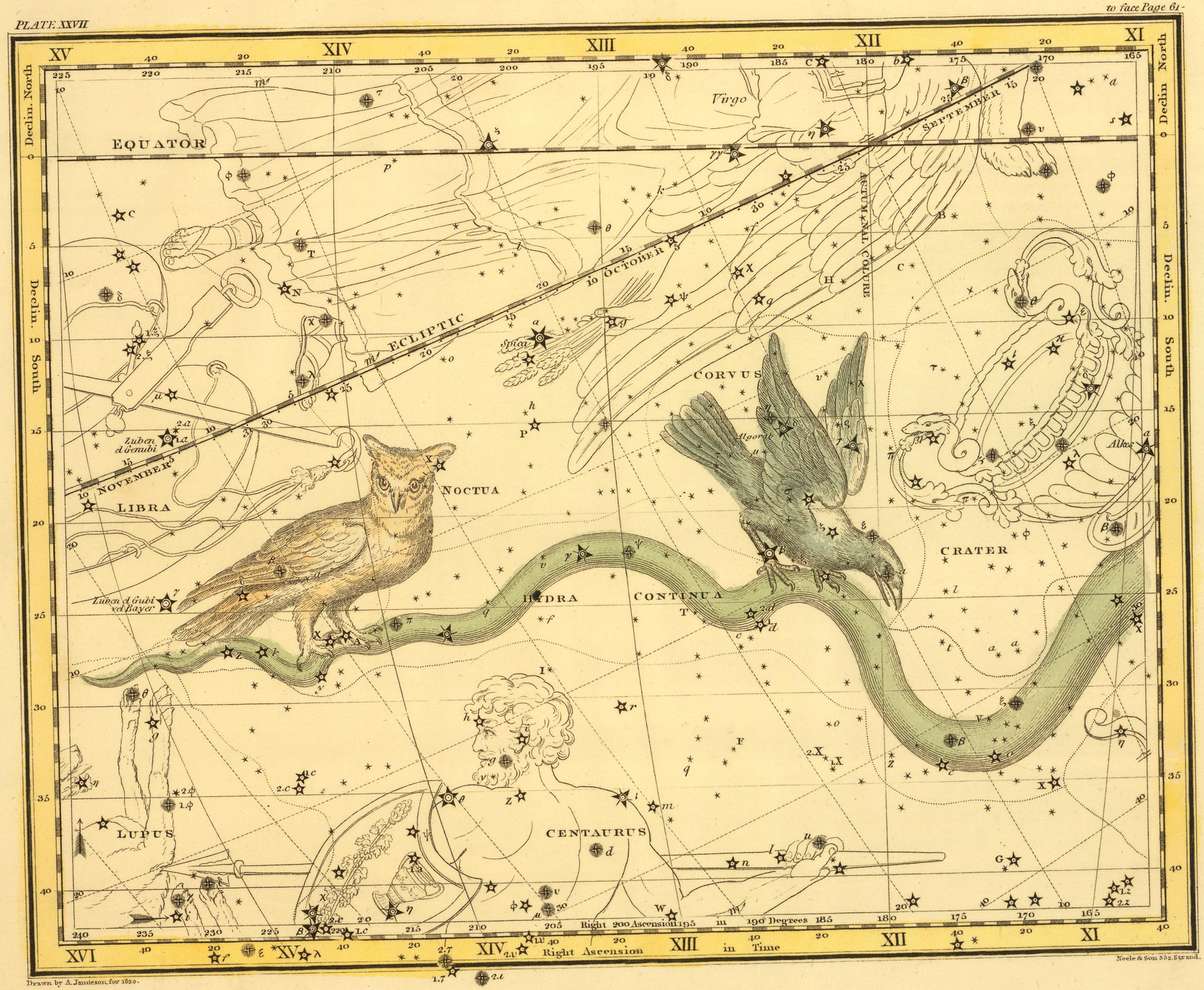

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PLATE XXVIII.

STEREOGRAPHIC PROJECTION OF THE SOUTHERN CELESTIAL HEMISPHERE ON THE PLANE OF THE EQUINOCTIAL.

To face page 62.

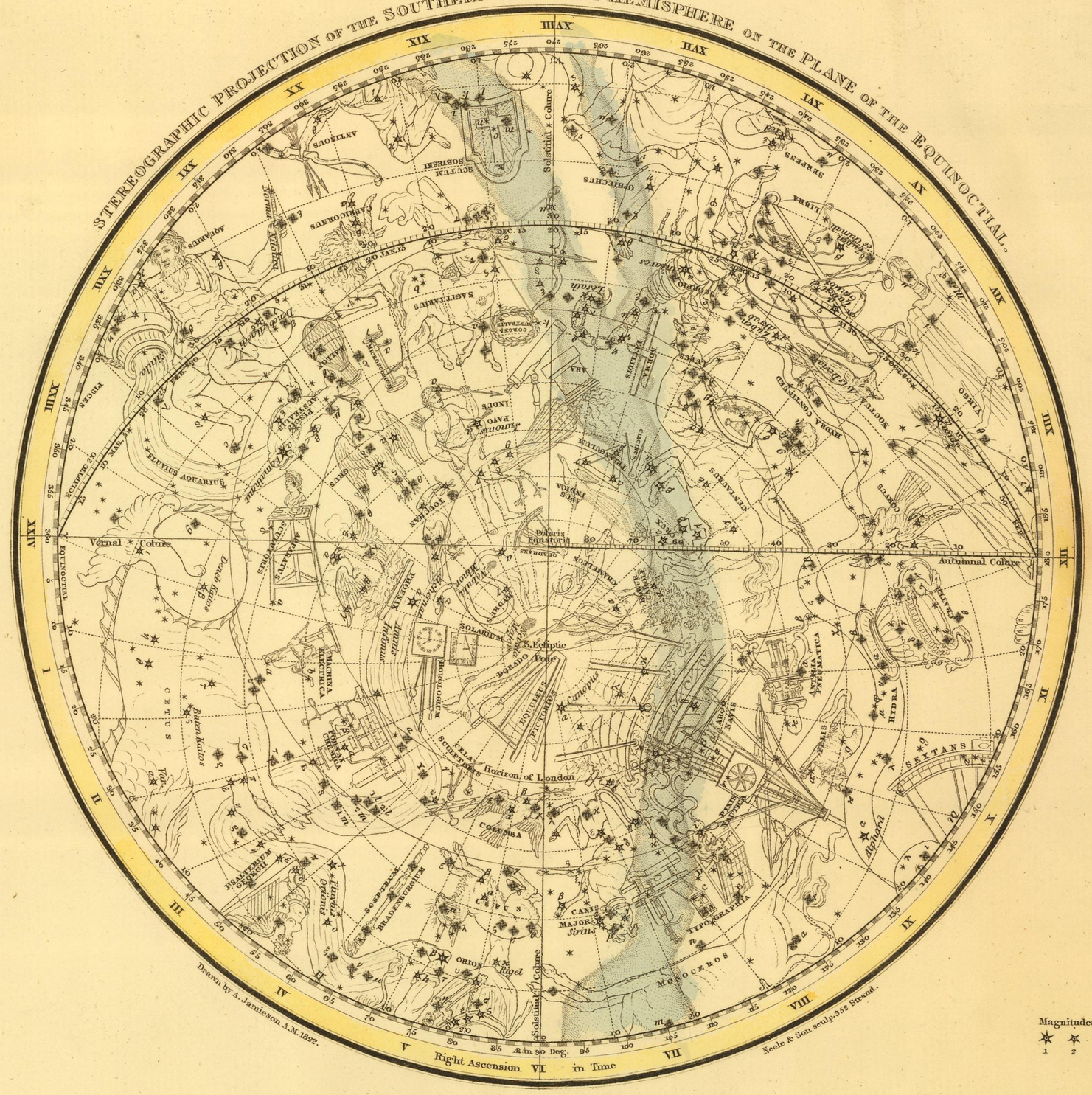

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PLATE XXIX

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The manner of finding the principal Stars visible to Great Britain by means of lines or Triangulation.

A Jamieson 1820

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Fig. 4

The various appearances of VENUS as she revolves round the SUN.

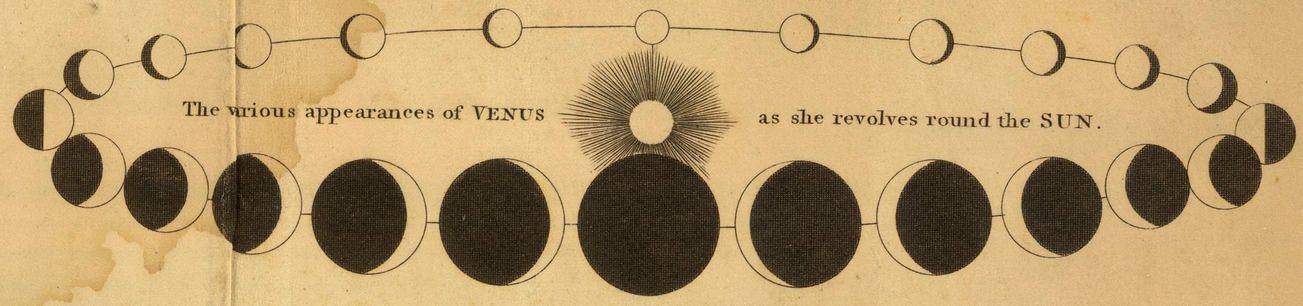
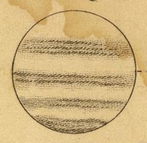


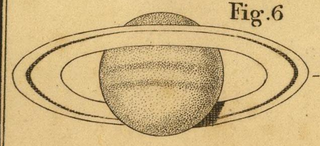
Fig. 5



JUPITER and his Moons or Satellites

1.st Satellite — 2.nd Satellite — 3.d Satellite — 4.th Satellite

Fig. 6



SATURN and his Moons or Satellites

1.st Satellite — 2.nd Satellite — 3.d Satellite — 4.th Satellite

Fig. 3

THE MOON

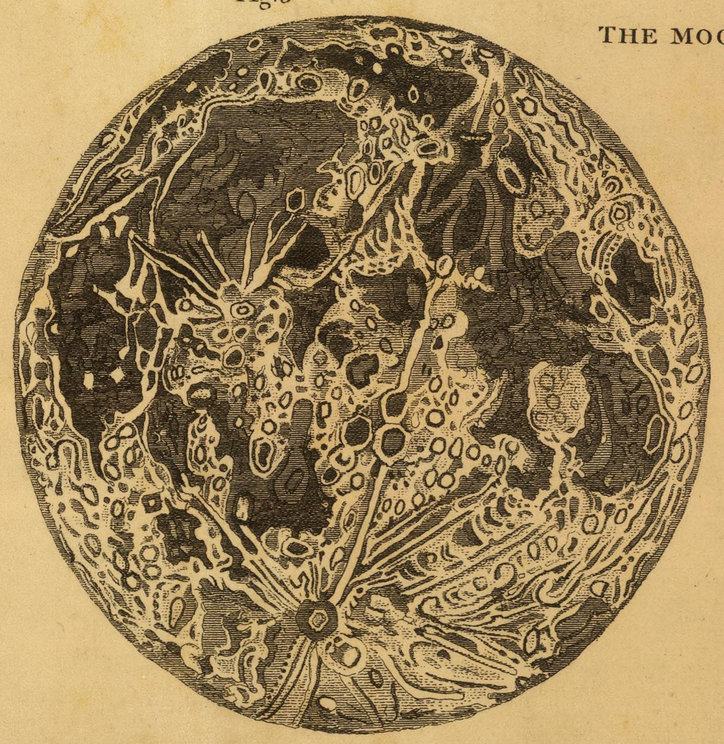


Fig. 1

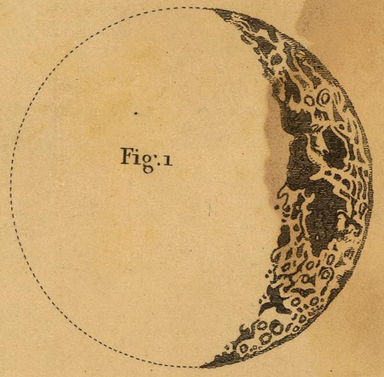
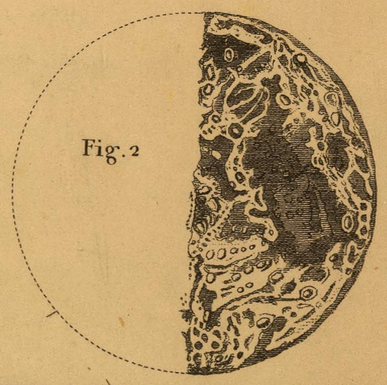
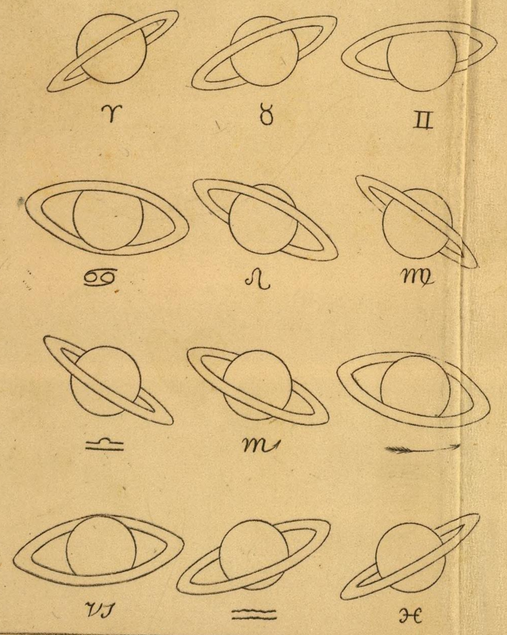


Fig. 2



SATURN in the twelve Signs of the Zodiac.



A. Jamieson 1820.

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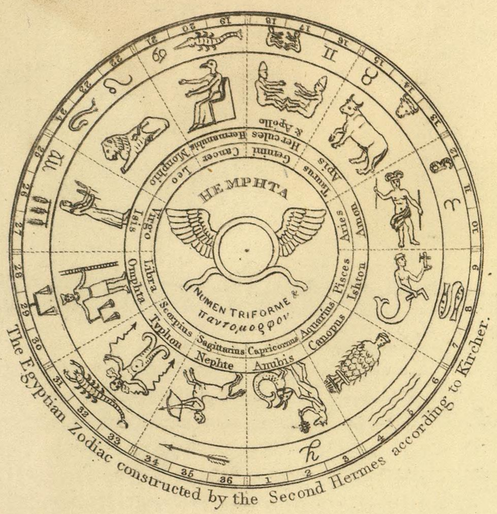
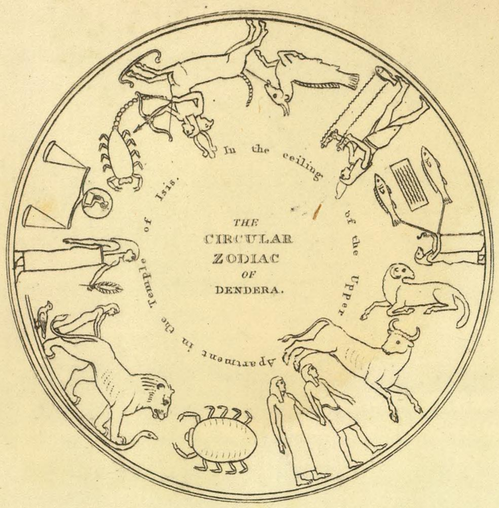
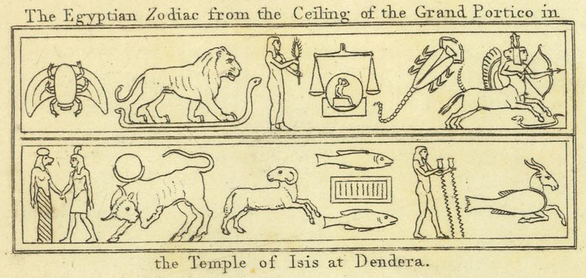


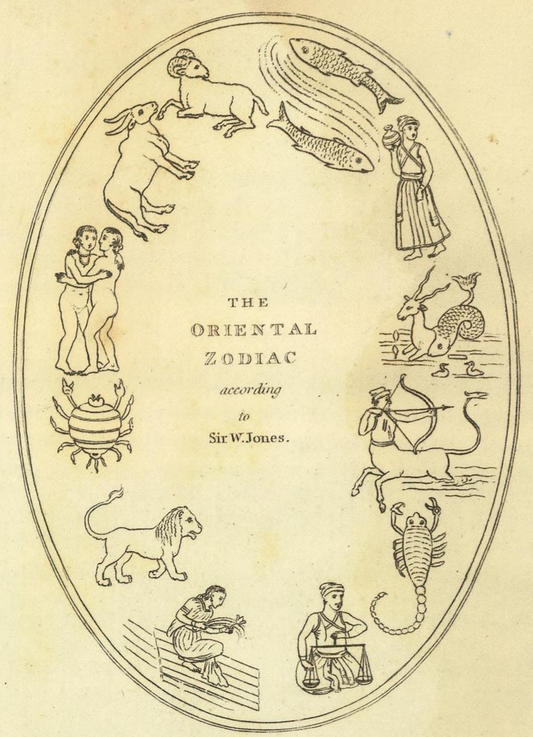
The Egyptian Zodiac constructed by the Second Hermes according to Kircher.

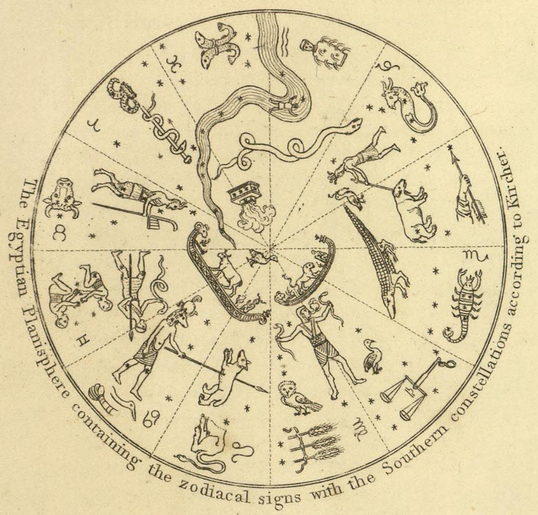


The Egyptian Zodiac from the Ceiling of the Grand Portico in

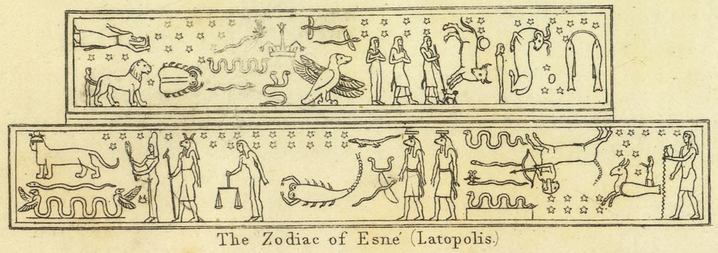


the Temple of Isis at Dendera.

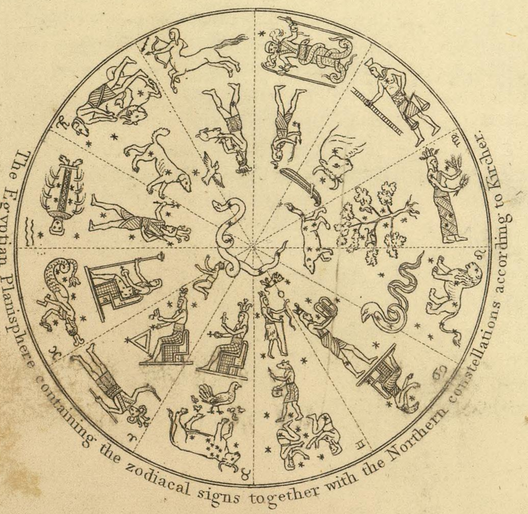




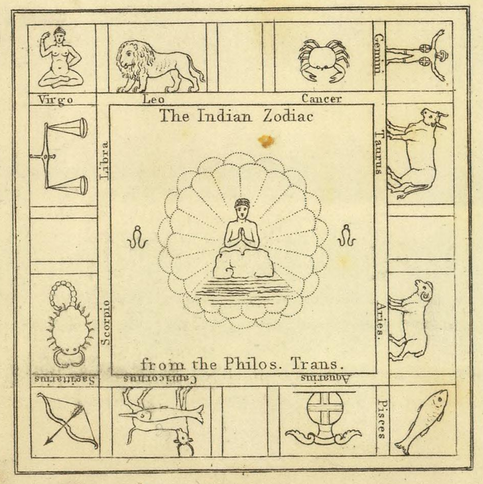
The Egyptian Planisphere containing the zodiacal signs with the Southern constellations according to Kircher.

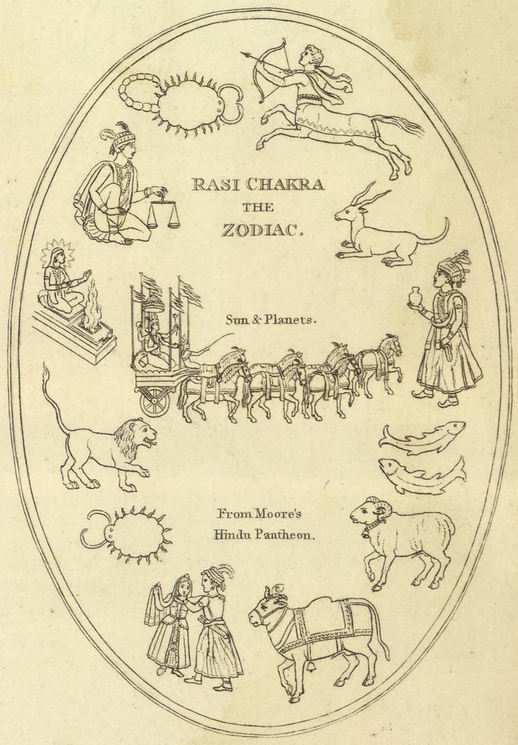


The Zodiac of Esne (Latopolis)



The Egyptian Planisphere containing the zodiacal signs together with the Northern constellations according to Kircher.





A. Jamieson, 1822.

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